



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

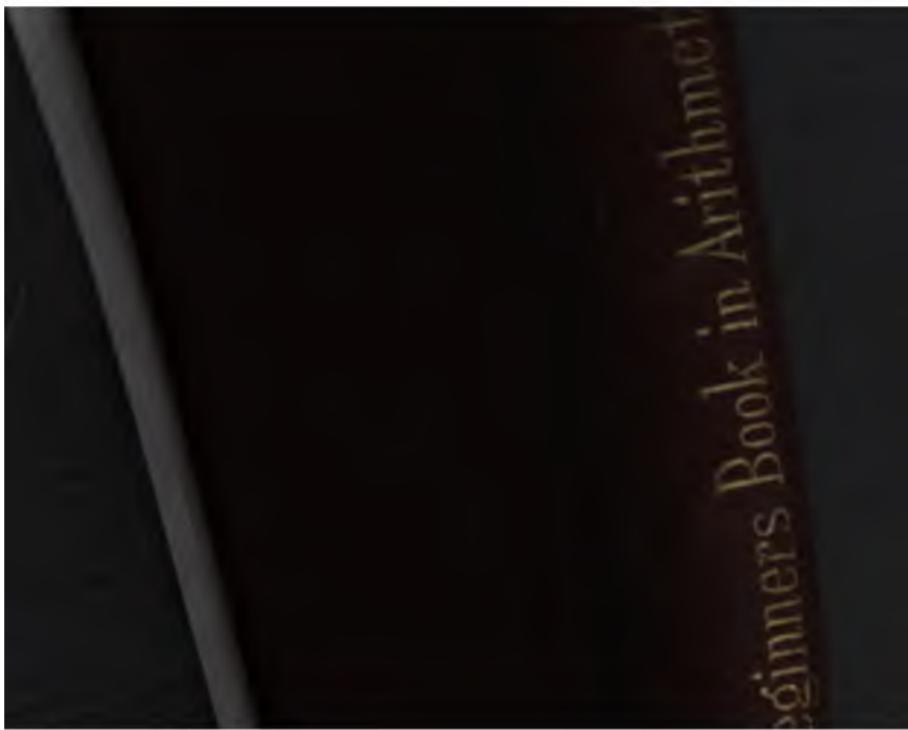
We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

Sons' Begimel's Book in Antimetic



Robinson's Beginner's Book in Arithmetic

Beginners Book in Arithmetic



EducT
118
87.752

Edw T 118, 87.752

Harriet E Smith

2/11-21 St



HARVARD
COLLEGE
LIBRARY



3 2044 097 002 000

W&Wilson







ROBINSON'S

BEGINNER'S BOOK

IN

ARITHMETIC

INTRODUCTORY TO

ROBINSON'S COMPLETE ARITHMETIC



IVISON, BLAKEMAN & COMPANY,
PUBLISHERS,
NEW YORK AND CHICAGO.

1887. C. W. C.

Edna 1
8.87.752

ROSS ELLIOT, L. WENTWORTH

SEP 10 1941

ROBINSON'S
TWO-BOOK COURSE
IN
ARITHMETIC.

BEGINNER'S BOOK IN ARITHMETIC. PRIMARY.

*COMPLETE ARITHMETIC. In one volume.**

ARITHMETICAL PROBLEMS. ORAL and WRITTEN.

*KEYS to COMPLETE ARITHMETIC and PROBLEMS,
in separate volumes, for Teachers.*

*Arithmetic, ORAL and WRITTEN, usually taught
in THREE books, is now offered, complete and
thorough, in ONE book, "THE COMPLETE ARITHMETIC."*

* This COMPLETE ARITHMETIC is also published in TWO VOLUMES. PART I.
and PART II. are each bound separately, in CLOTH.

CONTENTS.

Chapter I. Pages 4 to 72, inclusive.

Treating of the development of numbers, with special reference to the work and requirements of pupils in the Second Grade.

Chapter II. Pages 73 to 147, inclusive.

More advanced than Chapter I., and arranged with reference to Third Grade work, with tables of weight, measure, etc.

Chapter III. Pages 148 to 221, inclusive.

Fourth Grade work. Reviewing the preceding and treating of Reduction, Bills and Accounts, Cancellation, Interest, etc., etc.

CHAPTER I.

SUGGESTIONS TO TEACHERS.

After the method pursued in the first three lessons the teacher will please develop in the minds of the pupils the idea of the numbers from 11 to 20 inclusive, by the use of various kinds of objects, or of lines upon the black-board. These artificial helps should be abandoned at the earliest practicable moment, and the pupils led to rely upon the unaided power of the mind. The natural and progressive development suggested in the first three lessons, it is believed, will reduce the use of these helps to the minimum. Two aims in teaching numbers should always be kept in mind. 1st, To learn accuracy and facility in the operations of Addition, Subtraction, Multiplication and Division; and 2d, To learn when these operations are demanded in the solution of concrete problems.

The teacher will not proceed to Lesson IV until the development of the numbers mentioned above is secured.

The teacher should require pupils to use complete sentences in answer to questions.

LESSON I.

NUMBER 11.

TEACHER. Ten balls and one ball are how many balls?

PUPIL. Ten balls and one ball are eleven balls.

T. Eleven balls less one ball are how many balls?

P. Eleven balls less one ball are ten balls.

T. Nine books and two books are how many books?

P. Nine books and two books are eleven books.

T. Eleven books less two books are how many books?

P. Eleven books less two books are nine books.

T. What other two numbers of things are eleven things?

P. *Eight* things and *three* things are eleven things; or,
Seven things and *four* things are eleven things. *Etc.*

T. How is the number eleven shown by figures?

P. The number eleven is shown by figures in this way: *11*.
11 feet less 1 foot are how many feet?

10 hours and how many hours are 11 hours?

How many days and 1 day are 11 days?

11 pints less how many pints are 10 pints?

How many quarts less 1 quart are 10 quarts?

11 dollars less 2 dollars are how many dollars?

11 miles less 3 miles are how many miles?

9 gallons and 2 gallons are how many gallons?

8 pears and how many pears are 11 pears?

11 cents less how many cents are 9 cents?

11 eggs less 3 eggs are how many eggs?

Etc.

LESSON II.

NUMBER 12.

TEACHER. Eleven chairs and one chair are how many chairs ?

PUPIL. Eleven chairs and one chair are twelve chairs.

T. Twelve chairs less one chair are how many chairs ?

P. Twelve chairs less one chair are eleven chairs.

T. Ten keys and two keys are how many keys ?

P. Ten keys and two keys are twelve keys.

T. Twelve keys less two keys are how many keys ?

P. Twelve keys less two keys are ten keys.

T. What other two numbers of things are twelve things ?

P. *Nine* things and *three* things are *twelve* things; or

Eight things and *four* things are *twelve* things. *Etc.*

T. How is the number twelve shown by figures ?

P. The number twelve is shown by figures in this way: *12*.

12 birds less 1 bird are how many birds ?

12 pens less how many pens are 11 pens ?

How many shells and 1 shell are 12 shells ?

11 berries and how many berries are 12 berries ?

How many coats less 1 coat are 11 coats ?

12 lessons less 2 lessons are how many lessons ?

12 corks less 3 corks are how many corks ?

9 sheep and how many sheep are 12 sheep ?

12 peaches less 4 peaches are how many peaches ?

8 plums and how many plums are 12 plums ?

12 melons less how many melons are 9 melons ?

How many cars are 2 cars and 10 cars ?

Etc.

LESSON III.

NUMBER 13.

TEACHER. Twelve apples and one apple are how many apples?

PUPIL. Twelve apples and one apple are thirteen apples.

T. Thirteen apples less one apple are how many apples?

P. Thirteen apples less one apple are twelve apples.

T. Ten cherries and three cherries are how many cherries?

P. Ten cherries and three cherries are thirteen cherries.

T. Nine girls and four girls are how many girls?

P. Nine girls and four girls are thirteen girls.

T. Thirteen hats less one hat are how many hats?

P. Thirteen hats less one hat are twelve hats.

T. Thirteen cents less four cents are how many cents?

P. Thirteen cents less four cents are nine cents.

T. What other two numbers of things are thirteen things?

P. Eleven things and two things are thirteen things; or,
Nine things and four things are thirteen things. *Etc.*

T. How is the number thirteen shown by figures?

P. The number thirteen is shown by figures in this way: 13.

18 stars less 1 star are how many stars?

12 hoes and how many hoes are 13 hoes?

How many dogs and 3 dogs are 13 dogs?

How many miles less 4 miles are 9 miles?

18 horses less 5 horses are how many horses?

13 lines less how many lines are 10 lines?

9 days and how many days are 13 days?

8 buttons and how many buttons are 13 buttons?

Etc.

LESSON IV.

2 more than 11 equals what?
 2 less than 12 equals what?
 2 more than 12 equals what?
 2 less than 13 equals what?
 2 more than 14 equals what?
 2 less than 15 equals what?
 What equals 2 more than 16?
 What equals 2 less than 17?
 What equals 2 more than 18?
 What equals 2 less than 21?
 What equals 2 more than 21?
 What equals 2 less than 24?

LESSON V.

13 equals 2 more than what?
 12 equals 2 less than what?
 14 equals 2 more than what?
 14 equals 2 less than what?
 15 equals 2 more than what?
 16 equals 2 less than what?
 2 more than what equals 17?
 2 less than what equals 18?
 2 more than what equals 19?
 2 less than what equals 21?
 2 more than what equals 23?
 2 less than what equals 22?

LESSON VI.

3 more than 11 equals what?
 3 less than 12 equals what?
 3 more than 13 equals what?
 3 less than 17 equals what?
 3 more than 19 equals what?
 3 less than 25 equals what?
 What equals 3 more than 23?
 What equals 3 less than 27?
 What equals 3 more than 29?
 What equals 3 less than 31?
 What equals 3 more than 32?
 What equals 3 less than 36?

LESSON VII.

11 equals 3 less than what?
 12 equals 3 more than what?
 15 equals 3 less than what?
 17 equals 3 more than what?
 19 equals 3 less than what?
 21 equals 3 more than what?
 3 less than what equals 22?
 3 more than what equals 26?
 3 less than what equals 28?
 3 more than what equals 29?
 3 less than what equals 31?
 3 more than what equals 35?

LESSON VIII.

4 more than 11 equals what?
 4 less than 13 equals what?
 4 more than 15 equals what?
 4 less than 17 equals what?
 4 more than 19 equals what?
 4 less than 22 equals what?
 What equals 4 more than 24?
 What equals 4 less than 26?
 What equals 4 more than 33?
 What equals 4 less than 39?
 What equals 4 more than 43?
 What equals 4 less than 46?

LESSON IX.

12 equals 4 less than what?
 14 equals 4 more than what?
 16 equals 4 less than what?
 20 equals 4 more than what?
 25 equals 4 less than what?
 28 equals 4 more than what?
 4 less than what equals 38?
 4 more than what equals 35?
 4 less than what equals 37?
 4 more than what equals 42?
 4 less than what equals 45?
 4 more than what equals 47?

LESSON X.

5 more than 11 equals what?
 5 less than 19 equals what?
 5 more than 16 equals what?
 5 less than 22 equals what?
 5 more than 24 equals what?
 5 less than 28 equals what?
 What equals 5 more than 33?
 What equals 5 less than 31?
 What equals 5 more than 44?
 What equals 5 less than 47?
 What equals 5 more than 53?
 What equals 5 less than 59?

LESSON XI.

11 equals 5 less than what?
 17 equals 5 more than what?
 19 equals 5 less than what?
 23 equals 5 more than what?
 26 equals 5 less than what?
 29 equals 5 more than what?
 5 less than what equals 32?
 5 more than what equals 38?
 5 less than what equals 44?
 5 more than what equals 45?
 5 less than what equals 53?
 5 more than what equals 60?

LESSON XII.

T. What number equals 5 and 4? P. 9 equals 5 and 4.
 T. Since 9 equals 5 and 4 it is the sum of 5 and 4.
 T. What number equals 8 and 5? P. 8 equals 8 and 5.
 T. What is the sum of 8 and 5? P. 8 is the sum of 8 and 5.
 T. What is the sum of 4 and 8? P. 7 is the sum of 4 and 8.
 What is the sum of 1, 2 and 3? Of 2, 3 and 4?
 What is the sum of 2, 3 and 5? Of 3, 4 and 5?
 What is the sum of 9 and 2? Of 11 and 8?
 What is the sum of 12 and 2? Of 13 and 8?
 What is the sum of 12 and 4? Of 14 and 8?
 What is the sum of 14 and 4? Of 14 and 5?
 What is the sum of 15 and 4? Of 18 and 5?

LESSON XIII.

SUM.

$$\begin{array}{r} 2 \quad 3 \quad 2 \quad 8 \quad 4 \quad 2 \\ 2 \quad 2 \quad 8 \quad 8 \quad 2 \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \quad 8 \quad 5 \quad 2 \quad 5 \quad 8 \\ 3 \quad 4 \quad 2 \quad 5 \quad 8 \quad 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \quad 4 \quad 6 \quad 2 \quad 6 \quad 3 \\ 4 \quad 5 \quad 2 \quad 6 \quad 8 \quad 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \quad 4 \quad 7 \quad 5 \quad 8 \quad 8 \\ 4 \quad 6 \quad 5 \quad 7 \quad 2 \quad 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \quad 9 \quad 9 \quad 2 \quad 10 \quad 8 \\ 4 \quad 5 \quad 2 \quad 9 \quad 8 \quad 11 \\ \hline \end{array}$$

LESSON XIV.

SUM.

$$\begin{array}{r} 10 \quad 11 \quad 10 \quad 11 \quad 10 \quad 5 \\ 9 \quad 8 \quad 4 \quad 4 \quad 5 \quad 11 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \quad 18 \quad 14 \quad 8 \quad 4 \quad 15 \\ 4 \quad 8 \quad 5 \quad 14 \quad 18 \quad 3 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \quad 5 \quad 4 \quad 16 \quad 4 \quad 17 \\ 5 \quad 14 \quad 15 \quad 8 \quad 16 \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \quad 16 \quad 5 \quad 18 \quad 8 \quad 19 \\ 16 \quad 5 \quad 17 \quad 8 \quad 19 \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \quad 17 \quad 4 \quad 18 \quad 5 \quad 19 \\ 17 \quad 5 \quad 18 \quad 4 \quad 19 \quad 5 \\ \hline \end{array}$$

LESSON XV.

LESSON XVI.

SUM.

$$\begin{array}{r} 17 \quad 4 \quad 17 \quad 5 \quad 18 \quad 2 \\ 4 \quad 17 \quad 5 \quad 17 \quad 2 \quad 18 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \quad 8 \quad 18 \quad 4 \quad 18 \quad 5 \\ 3 \quad 18 \quad 4 \quad 18 \quad 5 \quad 18 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \quad 2 \quad 19 \quad 8 \quad 19 \quad 4 \\ 2 \quad 19 \quad 8 \quad 19 \quad 4 \quad 19 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \quad 5 \quad 21 \quad 2 \quad 21 \quad 8 \\ 5 \quad 19 \quad 2 \quad 21 \quad 3 \quad 21 \\ \hline \end{array}$$

$$\begin{array}{r} 21 \quad 4 \quad 21 \quad 5 \quad 22 \quad 5 \\ 4 \quad 21 \quad 5 \quad 21 \quad 4 \quad 23 \\ \hline \end{array}$$

$$\begin{array}{r} 82 \quad 4 \quad 33 \quad 35 \quad 35 \quad 35 \\ 2 \quad 3 \quad 4 \quad 8 \quad 4 \quad 5 \\ \hline \end{array}$$

$$\begin{array}{r} 48 \quad 42 \quad 45 \quad 44 \quad 52 \quad 54 \\ 2 \quad 8 \quad 3 \quad 4 \quad 5 \quad 5 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \quad 23 \quad 55 \quad 56 \quad 58 \quad 59 \\ 3 \quad 4 \quad 2 \quad 5 \quad 8 \quad 5 \\ \hline \end{array}$$

SUM.

$$\begin{array}{r} 12 \quad 12 \quad 11 \quad 18 \quad 14 \quad 15 \\ 11 \quad 12 \quad 18 \quad 12 \quad 12 \quad 18 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \quad 14 \quad 15 \quad 15 \quad 16 \quad 18 \\ 18 \quad 14 \quad 14 \quad 12 \quad 12 \quad 16 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \quad 21 \quad 22 \quad 28 \quad 24 \quad 24 \\ 22 \quad 22 \quad 23 \quad 24 \quad 24 \quad 25 \\ \hline \end{array}$$

$$\begin{array}{r} 25 \quad 25 \quad 25 \quad 32 \quad 38 \quad 35 \\ 22 \quad 23 \quad 24 \quad 25 \quad 24 \quad 23 \\ \hline \end{array}$$

$$\begin{array}{r} 35 \quad 36 \quad 36 \quad 42 \quad 43 \quad 45 \\ 34 \quad 32 \quad 33 \quad 35 \quad 34 \quad 33 \\ \hline \end{array}$$

$$\begin{array}{r} 46 \quad 44 \quad 43 \quad 47 \quad 53 \quad 52 \\ 52 \quad 54 \quad 53 \quad 52 \quad 55 \quad 44 \\ \hline \end{array}$$

$$\begin{array}{r} 53 \quad 54 \quad 55 \quad 54 \quad 56 \quad 57 \\ 48 \quad 45 \quad 44 \quad 45 \quad 48 \quad 42 \\ \hline \end{array}$$

$$\begin{array}{r} 51 \quad 52 \quad 53 \quad 54 \quad 55 \quad 56 \\ 45 \quad 33 \quad 44 \quad 35 \quad 34 \quad 42 \\ \hline \end{array}$$

LESSON XVII.

SUM.

1	8	2	3	2	8
2	2	3	2	8	8
8	1	2	8	8	2
—	—	—	—	—	—

1	1	3	1	8	1
2	8	2	8	2	4
4	4	2	5	4	2
—	—	—	—	—	—

2	8	2	3	2	8
2	3	4	4	8	4
4	4	4	4	5	5
—	—	—	—	—	—

8	2	5	4	8	4
2	4	8	8	8	4
5	5	2	5	5	5
—	—	—	—	—	—

8	4	5	5	5	5
4	5	4	5	5	5
5	5	4	8	2	5
—	—	—	—	—	—

4	3	5	5	5	5
4	3	5	4	4	5
4	3	5	3	4	4
2	2	2	2	8	4

LESSON XVIII.

SUM.

11	12	13	11	12	14
12	11	12	12	13	13
18	18	11	14	14	12
—	—	—	—	—	—

12	11	14	13	11	14
12	11	18	11	13	12
14	14	12	15	15	18
—	—	—	—	—	—

21	23	24	25	23	21
12	22	23	29	23	24
23	21	22	22	23	24
—	—	—	—	—	—

31	82	83	42	51	84
28	24	82	84	24	22
34	38	28	12	28	88
—	—	—	—	—	—

41	82	83	24	81	52
14	18	22	42	21	25
23	44	44	83	49	12
—	—	—	—	—	—

51	82	21	83	53	44
14	15	54	22	25	32
23	41	12	24	11	11
11	11	12	20	10	12

LESSON XIX.

SUM.				
121	122	228	322	248
212	212	892	238	844
312	218	184	432	422

222	582	458	833	222
313	255	222	254	404
424	102	801	402	851

552	403	804	202	880
204	258	852	844	245
148	882	228	452	803

850	505	844	222	505
428	250	488	505	202
105	148	120	241	100

121	212	818	822	855
348	484	121	288	522
504	852	844	404	121

852	512	424	210	248
204	854	842	445	842
342	121	288	828	404

LESSON XX.

SUM.				
212	283	418	521	422
821	842	242	145	845
121	224	834	228	121

213	502	405	850	481
141	158	852	214	805
425	284	141	225	421

804	505	821	482	555
408	850	184	214	111
250	143	522	852	182

450	842	425	512	403
204	405	153	144	292
222	251	802	228	144

855	444	824	841	414
100	211	251	414	852
843	822	824	200	112

928	222	804	421	428
814	838	858	153	248
251	482	241	822	221

LESSON XXI.

T. How much greater is 9 than 5? P. 9 is 4 greater than 5.
 T. How much less is 5 than 9? P. 5 is 4 less than 9.
 T. Since 9 is 4 greater than 5 and 5 is 4 less than 9, 4 is the difference between 5 and 9.
 T. How much more is 8 than 5? P. 8 is 3 more than 5.
 T. How much less is 5 than 8? P. 5 is 3 less than 8.
 T. What is 3 for that reason? P. 3 is the difference between 5 and 8.

How much greater is 7 than 8? *Ans.* 7 is 4 greater than 8.

How much less is 3 than 7? *Ans.* 3 is 4 less than 7.

What is the difference between 8 and 7? *Ans.* 4 is the difference between 8 and 7.

What is the difference between 8 and 8? Of 4 and 8?

What is the difference between 4 and 7? Of 4 and 9?

What is the difference between 4 and 10? Of 5 and 12?

LESSON XXII.

DIFFERENCE.

3	4	5	4	5	4
2	2	8	8	8	1
—	—	—	—	—	—

6	7	7	8	8	9
2	4	8	2	3	5
—	—	—	—	—	—

9	10	11	12	13	14
4	2	8	5	4	2
—	—	—	—	—	—

15	16	17	18	19	20
8	5	4	8	4	4
—	—	—	—	—	—

LESSON XXIII.

DIFFERENCE.

17	18	19	21	22	23
4	8	5	2	4	8
—	—	—	—	—	—

24	25	26	27	28	29
5	2	4	8	5	4
—	—	—	—	—	—

31	32	35	36	37	38
2	4	3	8	4	5
—	—	—	—	—	—

41	42	43	51	54	53
8	5	4	4	5	4
—	—	—	—	—	—

LESSON XXIV.

DIFFERENCE.

28	24	25	25	26	26
11	11	12	18	12	14
—	—	—	—	—	—

27	27	28	28	28	28
18	15	12	14	18	15
—	—	—	—	—	—

29	29	29	29	83	88
18	12	14	15	12	21
—	—	—	—	—	—

84	84	85	85	86	86
18	21	22	28	22	28
—	—	—	—	—	—

86	88	88	88	88	88
24	15	21	22	24	28
—	—	—	—	—	—

89	89	88	89	89	80
14	25	15	22	24	28
—	—	—	—	—	—

45	45	45	46	46	46
18	22	21	88	84	85
—	—	—	—	—	—

LESSON XXV.

DIFFERENCE.

47	47	47	48	48	48
14	28	82	18	24	85
—	—	—	—	—	—

54	54	54	55	55	55
18	22	81	18	24	82
—	—	—	—	—	—

56	56	56	57	57	57
15	24	38	28	34	42
—	—	—	—	—	—

58	58	58	59	59	59
14	88	44	28	82	45
—	—	—	—	—	—

64	64	64	65	65	65
82	41	58	88	43	24
—	—	—	—	—	—

66	66	66	67	67	67
84	42	54	84	82	45
—	—	—	—	—	—

68	68	68	69	69	69
25	88	44	45	54	68
—	—	—	—	—	—

LESSON XXVI.

DIFFERENCE.

$$\begin{array}{r}
 845 \\
 121 \\
 \hline
 \end{array}
 \begin{array}{r}
 482 \\
 201 \\
 \hline
 \end{array}
 \begin{array}{r}
 546 \\
 234 \\
 \hline
 \end{array}
 \begin{array}{r}
 687 \\
 388 \\
 \hline
 \end{array}
 \begin{array}{r}
 567 \\
 202 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 764 \\
 882 \\
 \hline
 \end{array}
 \begin{array}{r}
 685 \\
 821 \\
 \hline
 \end{array}
 \begin{array}{r}
 576 \\
 138 \\
 \hline
 \end{array}
 \begin{array}{r}
 468 \\
 124 \\
 \hline
 \end{array}
 \begin{array}{r}
 849 \\
 825 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 968 \\
 824 \\
 \hline
 \end{array}
 \begin{array}{r}
 887 \\
 584 \\
 \hline
 \end{array}
 \begin{array}{r}
 996 \\
 534 \\
 \hline
 \end{array}
 \begin{array}{r}
 986 \\
 582 \\
 \hline
 \end{array}
 \begin{array}{r}
 859 \\
 284 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 788 \\
 885 \\
 \hline
 \end{array}
 \begin{array}{r}
 847 \\
 842 \\
 \hline
 \end{array}
 \begin{array}{r}
 758 \\
 255 \\
 \hline
 \end{array}
 \begin{array}{r}
 964 \\
 121 \\
 \hline
 \end{array}
 \begin{array}{r}
 869 \\
 524 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 996 \\
 521 \\
 \hline
 \end{array}
 \begin{array}{r}
 848 \\
 521 \\
 \hline
 \end{array}
 \begin{array}{r}
 468 \\
 235 \\
 \hline
 \end{array}
 \begin{array}{r}
 688 \\
 285 \\
 \hline
 \end{array}
 \begin{array}{r}
 799 \\
 845 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 786 \\
 824 \\
 \hline
 \end{array}
 \begin{array}{r}
 945 \\
 482 \\
 \hline
 \end{array}
 \begin{array}{r}
 867 \\
 522 \\
 \hline
 \end{array}
 \begin{array}{r}
 678 \\
 825 \\
 \hline
 \end{array}
 \begin{array}{r}
 987 \\
 548 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 898 \\
 145 \\
 \hline
 \end{array}
 \begin{array}{r}
 694 \\
 852 \\
 \hline
 \end{array}
 \begin{array}{r}
 789 \\
 524 \\
 \hline
 \end{array}
 \begin{array}{r}
 569 \\
 245 \\
 \hline
 \end{array}
 \begin{array}{r}
 999 \\
 548 \\
 \hline
 \end{array}$$

LESSON XXVII.

DIFFERENCE.

$$\begin{array}{r}
 465 \\
 281 \\
 \hline
 \end{array}
 \begin{array}{r}
 564 \\
 282 \\
 \hline
 \end{array}
 \begin{array}{r}
 678 \\
 381 \\
 \hline
 \end{array}
 \begin{array}{r}
 768 \\
 428 \\
 \hline
 \end{array}
 \begin{array}{r}
 876 \\
 584 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 647 \\
 824 \\
 \hline
 \end{array}
 \begin{array}{r}
 658 \\
 835 \\
 \hline
 \end{array}
 \begin{array}{r}
 768 \\
 458 \\
 \hline
 \end{array}
 \begin{array}{r}
 796 \\
 458 \\
 \hline
 \end{array}
 \begin{array}{r}
 779 \\
 482 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 869 \\
 425 \\
 \hline
 \end{array}
 \begin{array}{r}
 897 \\
 458 \\
 \hline
 \end{array}
 \begin{array}{r}
 876 \\
 434 \\
 \hline
 \end{array}
 \begin{array}{r}
 874 \\
 482 \\
 \hline
 \end{array}
 \begin{array}{r}
 859 \\
 425 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 895 \\
 812 \\
 \hline
 \end{array}
 \begin{array}{r}
 748 \\
 825 \\
 \hline
 \end{array}
 \begin{array}{r}
 767 \\
 882 \\
 \hline
 \end{array}
 \begin{array}{r}
 878 \\
 528 \\
 \hline
 \end{array}
 \begin{array}{r}
 898 \\
 582 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 876 \\
 532 \\
 \hline
 \end{array}
 \begin{array}{r}
 897 \\
 482 \\
 \hline
 \end{array}
 \begin{array}{r}
 765 \\
 842 \\
 \hline
 \end{array}
 \begin{array}{r}
 698 \\
 853 \\
 \hline
 \end{array}
 \begin{array}{r}
 896 \\
 858 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 687 \\
 423 \\
 \hline
 \end{array}
 \begin{array}{r}
 984 \\
 532 \\
 \hline
 \end{array}
 \begin{array}{r}
 768 \\
 225 \\
 \hline
 \end{array}
 \begin{array}{r}
 786 \\
 522 \\
 \hline
 \end{array}
 \begin{array}{r}
 789 \\
 854 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 998 \\
 453 \\
 \hline
 \end{array}
 \begin{array}{r}
 899 \\
 854 \\
 \hline
 \end{array}
 \begin{array}{r}
 889 \\
 548 \\
 \hline
 \end{array}
 \begin{array}{r}
 988 \\
 845 \\
 \hline
 \end{array}
 \begin{array}{r}
 999 \\
 845 \\
 \hline
 \end{array}$$

LESSON XXVIII.

ORAL PROBLEMS.

1. John spent 2 cents for candy, and 2 cents for pens. How much did he spend?
2. A farmer sold a calf for 8 dollars and a pig for 4 dollars. How much did he receive for both?
3. A ton of coal cost \$6 and a cord of wood \$4. What is the cost of both?
4. One boy has \$5 and another \$3. How many dollars have both?
5. A sheep was bought for \$7 and sold for \$3 more. For how much was it sold?
6. 7 boxes of tea were sold to one man and 4 boxes to another. How many boxes were sold?
7. A boy rode 9 miles and walked 4 miles. How far did he travel?
8. A yard of velvet costs \$6, and a yard of cloth \$5. What is the cost of both?
9. Robert gave 8 nuts to his brother and kept 4. How many had he at first?
10. Sidney earned \$9 and Carl \$4. How much did both earn?
11. In a certain class there are 9 girls and 5 boys. How many pupils are there in the class?
12. A coat cost \$11 and a hat \$3. What is the cost of both?
13. \$12 was paid for a saddle and \$4 for a bridle. How much was paid for both?
14. If a slate cost 11 cents, and a top 4 cents, what is the cost of both?
15. There are 12 boys in one room and 5 boys in another. How many boys are there in both rooms?
16. 18 birds sit on one tree and 8 birds on another. How many birds sit on both trees?

LESSON XXIX.

1. A boy had 14 cents and found 4 cents. How many cents did he then have?
2. \$14 was spent for a shawl and \$8 for a bonnet. How much was spent for both?
3. How many cows has a farmer if he has 14 black ones and 5 white ones?
4. John shot 15 ducks and James shot 4. How many did both shoot?
5. George earned 15 cents in the forenoon and 5 cents in afternoon. How much did he earn in the day?
6. A boy counted 16 cars in one train and 2 in another. How many cars did he count?
7. A lady had \$16 left after spending \$8. How much had she at first?
8. Mr. A. walked 15 miles in the forenoon and 3 miles in the afternoon. How far did he walk?
9. Mary is 16 years old and Jane is 4 years older. How old is Jane?
10. Bought 16 yards of silk for a dress and 3 yards for a jacket. How many yards were bought?
11. George caught 16 fish and Burt 5 fish. How many fish did both catch?
12. Andrew picked 17 roses and Jay 4. How many roses did both pick?
13. A whip costs 17 cents and a top 4 cents. What is the cost of both?
14. A slate costs 17 cents and a pencil 5 cents. What is the cost of both?
15. If you read 18 pages to-day and 4 to-morrow, how many pages do you read both days?
16. If a pound of cheese costs 18 cents and a bar of soap 5 cents, what is the cost of both?

LESSON XXX.

1. Paid \$18 for a sleigh and \$5 for repairing it. What was the cost of the sleigh?
2. Earned \$19 in one day and \$4 the next. How much was earned in both days?
3. Paid \$21 for corn and \$3 for oats. How much was paid for both?
4. A boy had 24 marbles and won 4. How many had he then?
5. A drover had 25 horses in one pasture and 5 in another. How many horses had he in both?
6. Bought hams for \$32 and cider for \$4. How much was paid for both?
7. A book costs 34 cents and a pencil 5 cents. What is the cost of both?
8. A farmer had 85 sheep and bought 4. How many sheep had he then?
9. A man rode 37 miles and walked 5 miles. How far did he travel?
10. It is 38 miles from A to B and 4 miles further to C. How far is it from A to C?
11. Sold 39 bushels of oats and 3 more bushels of corn. How many bushels of corn were sold?
12. A boy lost 38 cents and had 5 cents left. How many cents had he at first?
13. There are 89 trees in one lot and 4 in another. How many trees are in both lots?
14. Took 39 bushels of wheat to the mill at one time and 5 at another time. How many bushels were taken?
15. Paid \$47 for a suit and \$4 for a hat. How much was paid for both?
16. James is 48 years old, which is 5 younger than William. How old is William?

LESSON XXXI.

WRITTEN PROBLEMS.

1. There are 15 cows in one field and 18 in another. How many are there in both fields?
2. Paid 14 cents for a pound of candles and 12 cents for coffee. How much was paid for both?
3. Sold 15 pounds of butter and had 14 pounds left. How many pounds had I at first?
4. Eddie earned 16 cents and found 18 cents. How many cents had he then?
5. Paid \$15 for a coat and \$18 for a cloak. What is the cost of both?
6. Sarah wrote 17 lines and Jane 12 lines. How many lines did both write?
7. John is 22 years old and his father is 25 years older. How old is the father?
8. There are 26 bushels of grain in one bin and 23 in another. How much is there in both bins?
9. A farm contains 88 acres of cleared land and 25 of wood land. How many acres in the farm?
10. From A to B is 35 miles and to C is 34 miles further. How far is it from A to C?
11. There are 31 days in March and 30 days in April. How many days are there in both?
12. Mr. B had 82 head of cattle, and bought 31 more. How many did he then have?
13. A farmer raised 82 bushels of wheat on one acre and 44 on another. How many bushels did he raise on both?
14. A man earned \$35 in May and \$32 in June. How much did he earn in both months?
15. James had 85 cents, which is 88 cents less than John's money. How much has John?

LESSON XXXII.

1. A boy's expenses were \$86 at Christmas and \$33 at New Year. What were his expenses for both days?

2. One steeple is 63 feet high, and another 85 feet higher. How high is the second steeple?

3. Paid \$74 for a horse and \$23 for a saddle. What is the cost of both?

4. Bought a horse for \$75 and sold it for \$24 more. For what was it sold?

5. John has \$64 in bank, which is \$35 less than what Robert has. How much has Robert?

6. A man has 46 acres in one lot and 52 acres in another. How much has he in both lots?

7. James earns \$54 a month and Bruce \$35. How much do both earn?

8. Bought a knife for 43 cents and a brush for 54 cents. What is the cost of both?

9. Paid \$58 for wheat and \$44 for corn. How much was paid for both?

10. Traveled 37 miles by boat and 42 miles by rail. How far did I travel?

11. There are 31 days in January and 28 in February. How many days are there in both months?

12. 47 years is 42 years less than Mr. B's age. How old is he?

13. Mr. A sold 53 acres of land to-day and 44 yesterday. How many acres did he sell both days?

14. Bought a book for 52 cents and a knife for 35 cents. What is the cost of both?

15. Mary gathered 54 chestnuts and Jane 33 chestnuts. How many chestnuts did they both gather?

16. A boy spent 54 cents and had 95 cents left. How much had he at first?

LESSON XXXIII.

ORAL PROBLEMS.

1. John had 4 marbles and lost two of them. How many had he left?
2. George having 5 cents spent 3 cents. How many cents had he left?
3. Jane picked 6 roses and gave away three of them. How many had she left?
4. 4 dollars were taken from a box containing 7 dollars. How many dollars were left?
5. 5 eggs were taken from a nest containing 8 eggs. How many eggs were left?
6. Rose is 9 years old and Kate is 4 years younger. How old is Kate?
7. Julia having 9 peaches gave away 3 of them. How many were left?
8. Ella bought 9 oranges and ate 4 of them. How many were left?
9. Paid 10 cents for a block and 3 cents less for paper. What is the cost of the paper?
10. Harry walked 10 miles and Fred 4 miles less. How far did Fred walk?
11. May had 10 credits and Leo 5 credits less. How many credits had Leo?
12. Rob earned \$11 and paid \$2 for a hat. How much had he left?
13. Eddie had 12 marbles and lost all but 3 of them. How many did he lose?
14. Mary is 12 years old and Blanche 4 years younger. How old is Blanche?
15. A book cost 18 cents and a pencil 3 cents. How much more did the book cost than the pencil?

LESSON XXXIV.

1. What is the difference between the cost of a saddle and a bridle if the saddle cost \$18 and the bridle \$4?
2. A man traveled 18 miles while a boy traveled 5 miles. How much farther did the man travel than the boy?
3. Mr. A. owed \$14 and paid \$4 of it. How much of it remained unpaid?
4. From a cask of water containing 14 gallons 5 gallons leaked out. How much remained?
5. From a piece of cloth containing 16 yards 5 yards were cut. How much remained?
6. In a pile of 17 oranges only 4 are good. How many are bad?
7. James earned \$18 and was paid all but \$5. How much was paid him?
8. How much greater is the cost of a shawl at \$19 than the cost of a bonnet at \$4?
9. A gentleman paid \$8 less than \$25 for a suit of clothes. How much was paid for the suit?
10. The distance from A to B is 26 miles, which is 4 miles more than the distance from A to C. What is the distance from A to C?
11. Sold a watch for \$27, which is \$5 more than it cost. What is the cost?
12. 4 ducks were killed out of a flock of 28 ducks. How many were left alive?
13. From a piece of silk containing 29 yards, 5 yards were cut. How many yards remained?
14. Out of a lot of 35 flowers Ruth took 4. How many were left?
15. 5 gallons leaked out of a barrel containing 31 gallons of molasses. How many gallons remained?

LESSON XXXV.

1. 88 gallons of water were put into a vessel and 4 gallons leaked out. How many gallons remained?
2. Mary has 86 peaches, which is 5 more than Julia has. How many has Julia?
3. Bought a watch for \$37 and sold it at a loss of \$4. How much was received for it?
4. Paid \$42 for a sleigh and \$8 less for a harness. What was paid for the harness?
5. A man is 48 years old and his wife is 4 years younger. How old is his wife?
6. Paid 44 cents for a whistle, which was 5 cents too much. What was the true price?
7. I have 45 bushels of wheat, which is 3 bushels more than my corn. How much corn have I?
8. Paid \$4 of a debt of \$46. How much is yet unpaid?
9. After traveling 5 miles of a journey of 49 miles, how much of the journey is yet to be traveled?
10. One boy caught 51 fish and another 8 fish. How many more did the first catch than the second?
11. William had 55 cents and spent all but 4 cents. How much did he spend?
12. Paid \$56 for a wagon, which is \$5 more than the cost of my cart. What is the cost of the cart?
13. A watch cost \$57 and a ring \$4. How much less did the ring cost than the watch?
14. A gentleman paid all but \$5 of a debt of \$58. How much was paid?
15. A farmer had 59 sheep and lost 4 of them. How many were left?
16. Paid \$58 for a wagon, which is \$5 more than I paid for a sleigh. How much was paid for the sleigh?

LESSON XXXVI.

WRITTEN PROBLEMS.

1. Mary had 25 cents and gave away 12 of them. How many had she left?
2. There are 27 cows in one field and 14 less in another. How many cows are in the other field?
3. If you have 36 buttons and lose 28 of them, how many have you left?
4. John has 89 cards which is 24 more than James has. How many has James?
5. Lucy is 15 years old. In how many years will she be 39 years old?
6. A boy has 23 cents. How much more should he have so that he may have 38 cents?
7. A lady had \$45 and lost all but \$21. How much did she lose?
8. George earned \$47 to-day and \$25 less yesterday. How much did he earn yesterday?
9. Of a case of 49 books 24 of them were damaged. How many were sound?
10. Of a herd of 48 cows 32 of them were red and the rest white. How many were white?
11. A gentleman having \$57 lost \$34. How much has he left?
12. A earned \$56 in May, which was \$33 more than B earned. How much did B earn?
13. A lady is 55 years old, which is 31 years older than her daughter. How old is her daughter?
14. Paid \$57 for a wagon, which is \$24 more than it cost. How much did it cost?
15. C has \$34. How much more should he have so that he may have \$58?

LESSON XXXVII.

1. A tower is 58 feet high, and another one 83 feet high. How much higher is the first than the second?
2. Bought a sleigh for \$64 and a saddle for \$31 less. What was the cost of the saddle?
3. Bought a wagon for \$67 and sold it for \$33. How much was lost?
4. Bought a watch for \$42 and sold it for \$68. How much was gained?
5. From a tree 75 feet high a piece 32 feet long was broken off. How much was left?
6. After traveling 85 miles, how much farther should one travel to make a journey of 78 miles?
7. A gentleman making a journey of 76 miles travels 41 miles the first day. How much of the journey is left?
8. Of a list of 79 words 35 were misspelled. How many were spelled correctly?
9. A man is 84 years old which is 41 years older than his son. How old is his son?
10. A lady is 48 years old. In how many years will she be 79 years old?
11. A man has \$87. How many dollars may he spend and have \$43 left?
12. A farmer bought 98 acres of land, all but 53 acres of which is wood land. How much is wood land?
13. D had 96 sheep and sold all but 42 of them. How many did he sell?
14. If you have \$43, how much more do you need so that you may have \$97?
15. A farmer took 99 eggs to market, and found that 85 of them were broken. How many were left whole?
16. A man is 98 years old. How old was he 43 years ago?

2	8	14	20
4	10	16	22
6	12	18	24

LESSON XXXVIII.

2 equals how many 2's?
 4 equals how many 2's?
 6 equals how many 2's?
 8 equals how many 2's?
 10 equals how many 2's?
 12 equals how many 2's?
 How many 2's equal 14?
 How many 2's equal 16?
 How many 2's equal 18?
 How many 2's equal 20?
 How many 2's equal 22?
 How many 2's equal 24?

LESSON XXXIX.

$\frac{1}{2}$ of 2 equals what?
 $\frac{1}{2}$ of 4 equals what?
 $\frac{1}{2}$ of 6 equals what?
 $\frac{1}{2}$ of 8 equals what?
 $\frac{1}{2}$ of 10 equals what?
 $\frac{1}{2}$ of 12 equals what?
 What equals $\frac{1}{2}$ of 14?
 What equals $\frac{1}{2}$ of 16?
 What equals $\frac{1}{2}$ of 18?
 What equals $\frac{1}{2}$ of 20?
 What equals $\frac{1}{2}$ of 22?
 What equals $\frac{1}{2}$ of 24?

LESSON XL.

1 equals $\frac{1}{2}$ of what?
 2 equals $\frac{1}{2}$ of what?
 3 equals $\frac{1}{2}$ of what?
 4 equals $\frac{1}{2}$ of what?
 5 equals $\frac{1}{2}$ of what?
 6 equals $\frac{1}{2}$ of what?
 $\frac{1}{2}$ of what equals 7?
 $\frac{1}{2}$ of what equals 8?
 $\frac{1}{2}$ of what equals 9?
 $\frac{1}{2}$ of what equals 10?
 $\frac{1}{2}$ of what equals 11?
 $\frac{1}{2}$ of what equals 12?

LESSON XLI.

1 equals what part of 2?
 2 equals what part of 4?
 3 equals what part of 6?
 4 equals what part of 8?
 5 equals what part of 10?
 6 equals what part of 12?
 What part of 14 equals 7?
 What part of 16 equals 8?
 What part of 18 equals 9?
 What part of 20 equals 10?
 What part of 22 equals 11?
 What part of 24 equals 12?

LESSON XLII.

11 and how many equal 19 ?
 13 and how many equal 15 ?
 16 less how many equal 14 ?
 18 less how many equal 16 ?
 15 and how many equal 17 ?
 16 and how many equal 18 ?
 17 less how many equal 15 ?
 19 less how many equal 17 ?
 18 and how many equal 20 ?
 21 less how many equal 19 ?
 21 and how many equal 23 ?
 24 less how many equal 22 ?

LESSON XLIII.

11 is what more than 9 ?
 12 is what less than 14 ?
 14 is what more than 12 ?
 13 is what less than 15 ?
 16 is what more than 14 ?
 15 is what less than 17 ?
 What more than 16 is 18 ?
 What less than 19 is 17 ?
 What less than 18 is 16 ?
 What less than 20 is 18 ?
 What less than 21 is 19 ?
 What more than 21 is 23 ?

LESSON XLIV.

5 equals how many 2's ?
 5 equals two 2's and 1.
 7 equals how many 2's ?
 9 equals how many 2's ?
 11 equals how many 2's ?
 13 equals how many 2's ?
 How many 2's equal 15 ?
 How many 2's equal 17 ?
 How many 2's equal 19 ?
 How many 2's equal 21 ?
 How many 2's equal 23 ?
 How many 2's equal 25 ?

LESSON XLV.

What is $\frac{1}{2}$ of \$4 ?
 What is $\frac{1}{2}$ of 6 pencils ?
 What is $\frac{1}{2}$ of 8 books ?
 What is $\frac{1}{2}$ of 10 knives ?
 What is $\frac{1}{2}$ of 14 gallons ?
 What is $\frac{1}{2}$ of 12 feet ?
 $\frac{1}{2}$ of 16 cents is what ?
 $\frac{1}{2}$ of 18 inches is what ?
 $\frac{1}{2}$ of 22 hours is what ?
 $\frac{1}{2}$ of 24 acres is what ?
 $\frac{1}{2}$ of 20 miles is what ?
 $\frac{1}{2}$ of a dozen is what ?

3	15	27
6	18	30
9	21	33
12	24	36

LESSON XLVI.

How many 3's equal 3?

How many 3's equal 6?

How many 3's equal 9?

How many 3's equal 12?

How many 3's equal 15?

How many 3's equal 18?

21 equals how many 3's?

24 equals how many 3's?

27 equals how many 3's?

30 equals how many 3's?

33 equals how many 3's?

36 equals how many 3's?

LESSON XLVII.

$\frac{1}{3}$ of 8 equals what?

$\frac{1}{3}$ of 6 equals what?

$\frac{1}{3}$ of 9 equals what?

$\frac{1}{3}$ of 12 equals what?

$\frac{1}{3}$ of 15 equals what?

$\frac{1}{3}$ of 18 equals what?

What equals $\frac{1}{3}$ of 21?

What equals $\frac{1}{3}$ of 24?

What equals $\frac{1}{3}$ of 27?

What equals $\frac{1}{3}$ of 30?

What equals $\frac{1}{3}$ of 33?

What equals $\frac{1}{3}$ of 36?

LESSON XLVIII.

1 equals $\frac{1}{3}$ of what?

2 equals $\frac{1}{3}$ of what?

3 equals $\frac{1}{3}$ of what?

4 equals $\frac{1}{3}$ of what?

5 equals $\frac{1}{3}$ of what?

6 equals $\frac{1}{3}$ of what?

$\frac{1}{3}$ of what equals 7?

$\frac{1}{3}$ of what equals 8?

$\frac{1}{3}$ of what equals 9?

$\frac{1}{3}$ of what equals 10?

$\frac{1}{3}$ of what equals 11?

$\frac{1}{3}$ of what equals 12?

LESSON XLIX.

1 equals what part of 9?

2 equals what part of 6?

3 equals what part of 9?

4 equals what part of 12?

5 equals what part of 15?

6 equals what part of 18?

What part of 21 equals 7?

What part of 24 equals 8?

What part of 27 equals 9?

What part of 30 equals 10?

What part of 33 equals 11?

What part of 36 equals 12?

LESSON L.

11 and how many equal 14?
 12 less how many equal 9?
 13 and how many equal 16?
 14 less how many equal 11?
 15 and how many equal 18?
 15 less how many equal 12?
 17 and how many equal 20?
 19 less how many equal 16?
 22 and how many equal 25?
 27 less how many equal 24?
 29 and how many equal 32?
 35 less how many equal 32?

LESSON LI.

14 is what more than 11?
 15 is what more than 12?
 13 is what less than 15?
 16 is what less than 19?
 17 is what more than 14?
 18 is what less than 21?
 What more than 19 is 22?
 What less than 26 is 23?
 What more than 25 is 28?
 What less than 34 is 31?
 What more than 29 is 32?
 What less than 37 is 34?

LESSON LII.

5 equals how many 3's?
 7 equals how many 3's?
 8 equals how many 3's?
 10 equals how many 3's?
 11 equals how many 3's?
 14 equals how many 3's?
 How many 3's equals 17?
 How many 3's equals 20?
 How many 3's equals 22?
 How many 3's equals 26?
 How many 3's equals 29?
 How many 3's equals 34?

LESSON LIII.

$\frac{1}{3}$ of 6 corks is what?
 $\frac{1}{3}$ of 9 marbles is what?
 $\frac{1}{3}$ of 12 geese is what?
 $\frac{1}{3}$ of 18 rods is what?
 $\frac{1}{3}$ of 15 minutes is what?
 $\frac{1}{3}$ of 24 yards is what?
 What is $\frac{1}{3}$ of 21 years?
 What is $\frac{1}{3}$ of 27 months?
 What is $\frac{1}{3}$ of 80 pinks?
 What is $\frac{1}{3}$ of 88 roses?
 What is $\frac{1}{3}$ of 36 days?
 What is $\frac{1}{3}$ of a dozen?

4	20	86
8	24	40
12	28	44
16	32	48

LESSON LIV.

How many 4's equal 4?
 How many 4's equal 8?
 How many 4's equal 12?
 How many 4's equal 16?
 How many 4's equal 20?
 How many 4's equal 24?
 28 equals how many 4's?
 32 equals how many 4's?
 36 equals how many 4's?
 40 equals how many 4's?
 44 equals how many 4's?
 48 equals how many 4's?

LESSON LVI.

1 equals $\frac{1}{4}$ of what?
 2 equals $\frac{1}{4}$ of what?
 3 equals $\frac{1}{4}$ of what?
 4 equals $\frac{1}{4}$ of what?
 5 equals $\frac{1}{4}$ of what?
 6 equals $\frac{1}{4}$ of what?
 $\frac{1}{4}$ of what equals 7?
 $\frac{1}{4}$ of what equals 8?
 $\frac{1}{4}$ of what equals 9?
 $\frac{1}{4}$ of what equals 10?
 $\frac{1}{4}$ of what equals 11?
 $\frac{1}{4}$ of what equals 12?

LESSON LV.

$\frac{1}{4}$ of 4 equals what?
 $\frac{1}{4}$ of 8 equals what?
 $\frac{1}{4}$ of 12 equals what?
 $\frac{1}{4}$ of 16 equals what?
 $\frac{1}{4}$ of 20 equals what?
 $\frac{1}{4}$ of 24 equals what?
 What equals $\frac{1}{4}$ of 28?
 What equals $\frac{1}{4}$ of 32?
 What equals $\frac{1}{4}$ of 36?
 What equals $\frac{1}{4}$ of 40?
 What equals $\frac{1}{4}$ of 44?
 What equals $\frac{1}{4}$ of 48?

LESSON LVII.

1 equals what part of 4?
 2 equals what part of 8?
 3 equals what part of 12?
 4 equals what part of 16?
 5 equals what part of 20?
 6 equals what part of 24?
 What part of 28 equals 7?
 What part of 32 equals 8?
 What part of 36 equals 9?
 What part of 40 equals 10?
 What part of 44 equals 11?
 What part of 48 equals 12?

LESSON LVIII.

11 and how many equal 15 ?
 13 less how many equal 9 ?
 12 and how many equal 16 ?
 15 less how many equal 11 ?
 14 and how many equal 18 ?
 16 less how many equal 12 ?
 23 and how many equal 27 ?
 29 less how many equal 25 ?
 31 and how many equal 35 ?
 33 less how many equal 29 ?
 32 and how many equal 36 ?
 37 less how many equal 38 ?

LESSON LIX.

15 is what more than 11 ?
 12 is what less than 16 ?
 17 is what more than 18 ?
 19 is what less than 23 ?
 22 is what more than 18 ?
 25 is what less than 29 ?
 What less than 30 is 26 ?
 What more than 27 is 31 ?
 What less than 41 is 37 ?
 What more than 41 is 45 ?
 What less than 44 is 40 ?
 What more than 45 is 49 ?

LESSON LX.

5 equals how many 4's ?
 11 equals how many 4's ?
 14 equals how many 4's ?
 19 equals how many 4's ?
 21 equals how many 4's ?
 26 equals how many 4's ?
 How many 4's equal 31 ?
 How many 4's equal 38 ?
 How many 4's equal 43 ?
 How many 4's equal 47 ?
 How many 4's equal 46 ?
 How many 4's equal 50 ?

LESSON LXI.

$\frac{1}{4}$ of 8 birds is what ?
 $\frac{1}{4}$ of 12 mice is what ?
 $\frac{1}{4}$ of 16 men is what ?
 $\frac{1}{4}$ of 24 dollars is what ?
 $\frac{1}{4}$ of 20 miles is what ?
 $\frac{1}{4}$ of 28 pins is what ?
 What is $\frac{1}{4}$ of 36 inches ?
 What is $\frac{1}{4}$ of 32 cars ?
 What is $\frac{1}{4}$ of 40 cows ?
 What is $\frac{1}{4}$ of 86 hats ?
 What is $\frac{1}{4}$ of 44 watches ?
 What is $\frac{1}{4}$ of 48 sheep ?

5	25	45
10	30	50
15	35	55
20	40	60

LESSON LXII.

5 equals how many 5's?
 10 equals how many 5's?
 15 equals how many 5's?
 20 equals how many 5's?
 25 equals how many 5's?
 30 equals how many 5's?
 How many 5's equal 35?
 How many 5's equal 40?
 How many 5's equal 45?
 How many 5's equal 50?
 How many 5's equal 55?
 How many 5's equal 60?

LESSON LXIV.

1 equals $\frac{1}{5}$ of what?
 2 equals $\frac{1}{5}$ of what?
 3 equals $\frac{1}{5}$ of what?
 4 equals $\frac{1}{5}$ of what?
 5 equals $\frac{1}{5}$ of what?
 6 equals $\frac{1}{5}$ of what?
 $\frac{1}{5}$ of what equals 7?
 $\frac{1}{5}$ of what equals 8?
 $\frac{1}{5}$ of what equals 9?
 $\frac{1}{5}$ of what equals 10?
 $\frac{1}{5}$ of what equals 11?
 $\frac{1}{5}$ of what equals 12?

LESSON LXIII.

$\frac{1}{5}$ of 5 equals what?
 $\frac{1}{5}$ of 10 equals what?
 $\frac{1}{5}$ of 20 equals what?
 $\frac{1}{5}$ of 15 equals what?
 $\frac{1}{5}$ of 25 equals what?
 $\frac{1}{5}$ of 30 equals what?
 What equals $\frac{1}{5}$ of 30?
 What equals $\frac{1}{5}$ of 40?
 What equals $\frac{1}{5}$ of 50?
 What equals $\frac{1}{5}$ of 45?
 What equals $\frac{1}{5}$ of 55?
 What equals $\frac{1}{5}$ of 60?

LESSON LXV.

1 equals what part of 5?
 2 equals what part of 10?
 3 equals what part of 15?
 4 equals what part of 20?
 5 equals what part of 25?
 6 equals what part of 30?
 What part of 35 equals 7?
 What part of 40 equals 8?
 What part of 45 equals 9?
 What part of 50 equals 10?
 What part of 55 equals 11?
 What part of 60 equals 12?

LESSON LXVI.

11 and how many equal 16?
 14 less how many equal 9?
 18 and how many equal 18?
 16 less how many equal 11?
 14 and how many equal 19?
 17 less how many equal 12?
 19 and how many equal 24?
 28 less how many equal 23?
 31 and how many equal 36?
 37 less how many equal 32?
 46 and how many equal 51?
 58 less how many equal 53?

LESSON LXVII.

16 is what more than 11?
 18 is what less than 18?
 17 is what less than 22?
 21 is what more than 16?
 28 is what less than 33?
 32 is what more than 27?
 What less than 44 is 39?
 What more than 38 is 43?
 What less than 52 is 47?
 What more than 49 is 54?
 What less than 61 is 56?
 What more than 57 is 62?

LESSON LXVIII.

7 equals how many 5's?
 18 equals how many 5's?
 19 equals how many 5's?
 23 equals how many 5's?
 26 equals how many 5's?
 32 equals how many 5's?
 How many 5's equal 38?
 How many 5's equal 44?
 How many 5's equal 48?
 How many 5's equal 58?
 How many 5's equal 59?
 How many 5's equal 68?

LESSON LXIX.

$\frac{1}{5}$ of 10 apples is what?
 $\frac{1}{5}$ of 20 boys is what?
 $\frac{1}{5}$ of 15 oranges is what?
 $\frac{1}{5}$ of 25 books is what?
 $\frac{1}{5}$ of 35 pins is what?
 $\frac{1}{5}$ of 80 sparrows is what?
 What is $\frac{1}{5}$ of 40 days?
 What is $\frac{1}{5}$ of 50 stars?
 What is $\frac{1}{5}$ of 45 cups?
 What is $\frac{1}{5}$ of 55 rings?
 What is $\frac{1}{5}$ of 60 nails?
 What is $\frac{1}{5}$ of a score?

REVIEW OF THE FACTS.

LESSON LXX.

Three 2's equal what? Two 8's? Four 2's? Two 4's?
 Three 8's? Two 5's? Five 2's? Two 6's? Three 4's?
 Four 8's? Two 7's? Three 5's? Five 8's? Two 8's?
 Four 4's? Two 9's? Three 6's? Four 5's? Five 4's?
 Three 7's? Two 11's? Two 12's? Three 8's? Four 6's?

• How many are 5 times 5? 8 times 9? 4 times 7?
 3 times 10? 5 times 6? 4 times 8? 8 times 11?
 5 times 7? 8 times 12? 4 times 9? 4 times 10?
 5 times 8? 4 times 11? 5 times 9? 5 times 10?
 5 times 11? 5 times 12?

LESSON LXXI.

2 what equal 4? 6? 8? 10? 12? 14? 16? 18?
 20? 22? 24?

$\frac{1}{2}$ of 4 is what? 6? 8? 10? 12? 14? 16? 18?
 20? 22? 24?

3 what equal 6? 9? 12? 15? 18? 21? 24? 27?
 30? 33? 36?

$\frac{1}{3}$ of 6 is what? 9? 12? 15? 18? 21? 24? 27?
 30? 33? 36?

4 what equal 8? 12? 16? 20? 24? 28? 32? 36?
 40? 44? 48?

$\frac{1}{4}$ of 8 is what? 12? 16? 20? 24? 28? 32? 36?
 40? 44? 48?

5 what equal 10? 15? 20? 25? 30? 35? 40? 45?
 50? 55? 60?

$\frac{1}{5}$ of 10 is what? 15? 20? 25? 30? 35? 40? 45?
 50? 55? 60?

LESSON LXXII.

2 dollars equal $\frac{1}{2}$ of what?
 2 days equal $\frac{1}{3}$ of what?
 2 miles equal $\frac{1}{4}$ of what?
 2 sheep equal $\frac{1}{5}$ of what?
 3 books equal $\frac{1}{2}$ of what?
 3 peaches equal $\frac{1}{3}$ of what?
 $\frac{1}{4}$ of what equals 3 balls?
 $\frac{1}{5}$ of what equals 3 dollars?
 $\frac{1}{2}$ of what equals 4 spools?
 $\frac{1}{3}$ of what equals 4 corks?
 $\frac{1}{4}$ of what equals 4 shells?
 $\frac{1}{5}$ of what equals 4 birds?

LESSON LXXIV.

8 trees equal $\frac{1}{2}$ of what?
 8 girls equal $\frac{1}{3}$ of what?
 8 mice equal $\frac{1}{4}$ of what?
 8 ships equal $\frac{1}{5}$ of what?
 9 feet equal $\frac{1}{2}$ of what?
 9 cars equal $\frac{1}{3}$ of what?
 $\frac{1}{4}$ of what equals 9 pens?
 $\frac{1}{5}$ of what equals 9 grains?
 $\frac{1}{2}$ of what equals 10 pages?
 $\frac{1}{3}$ of what equals 10 dollars?
 $\frac{1}{4}$ of what equals 10 inches?
 $\frac{1}{5}$ of what equals 10 hours?

LESSON LXXIII.

5 fans equal $\frac{1}{2}$ of what?
 5 hats equal $\frac{1}{3}$ of what?
 5 letters equal $\frac{1}{4}$ of what?
 5 rings equal $\frac{1}{5}$ of what?
 6 men equal $\frac{1}{2}$ of what?
 6 acres equal $\frac{1}{3}$ of what?
 $\frac{1}{4}$ of what equals 6 hours?
 $\frac{1}{5}$ of what equals 6 buttons?
 $\frac{1}{2}$ of what equals 7 blocks?
 $\frac{1}{3}$ of what equals 7 pints?
 $\frac{1}{4}$ of what equals 7 quarts?
 $\frac{1}{5}$ of what equals 7 dimes?

LESSON LXXV.

$\frac{1}{2}$ of what equals 11 women?
 $\frac{1}{3}$ of what equals 11 acres?
 $\frac{1}{4}$ of what equals 11 cases?
 $\frac{1}{5}$ of what equals 11 spoons?
 $\frac{1}{2}$ of what equals 12 days?
 $\frac{1}{3}$ of what equals 12 nights?
 12 cents equal $\frac{1}{4}$ of what?
 12 hours equal $\frac{1}{5}$ of what?
 12 inches equal $\frac{2}{3}$ of what?
 12 feet equal $\frac{2}{5}$ of what?
 12 marbles equal $\frac{2}{3}$ of what?
 12 cents equal $\frac{4}{5}$ of what?

LESSON LXXVI.

1. If one apple cost 8 cents, what is the cost of 2 apples?
2. If one orange cost 4 cents, what is the cost of 2 oranges?
3. At 3 cents each, what is the cost of 8 tops?
4. At 5 cents a yard, what is the cost of 2 yards of tape?
5. At 4 cents a pound; what is the cost of 8 pounds of flour?
6. What is the cost of 4 feet of rope at 8 cents a foot?
7. What is the cost of 5 pencils at 8 cents each?
8. James has 7 dollars and George has 2 times as many. How many has George?
9. If a man can walk 4 miles an hour, how far can he walk in 4 hours?
10. Mary is 8 years old and Sarah is 2 times as old. How old is Sarah?
11. If there are 9 panes of glass in each window, how many panes are there in 2 windows?
12. If a boy can earn \$5 each week, how much can he earn in 4 weeks?
13. What is the cost of 2 bonnets at \$11 each?
14. Mr. A traveled 7 miles by stage and 3 times as far by car. How far did he travel by car?
15. James earns \$12 a month and John 2 times as much. How much does John earn?
16. What is the cost of 8 yards of silk at \$8 a yard?
17. At \$6 a barrel what is the cost of 4 barrels of flour?
18. John is 6 years old, and his father is 5 times as old. How old is his father?
19. At \$9 a ton, what is the cost of 5 tons of coal?

LESSON LXXIV.

1. At 5 cents a quart, what is the cost of 5 quarts of berries?
2. A man walked 9 miles and rode 8 times as far. How far did he ride?
3. What is the cost of 4 yards of tape at 7 cents a yard?
4. If a man can earn \$10 each week, how much can he earn in 8 weeks?
5. What is the cost of 5 oranges at 6 cents each?
6. At \$8 a ton, what is the cost of 4 tons of coal?
7. At \$11 a cord, what is the cost of 8 cords of wood?
8. A boy earns \$7 a week and his father earns 5 times as much. How much does the father earn?
9. What is the cost of 8 barrels of chestnuts at \$12 a barrel?
10. Daniel worked 9 days and David 4 times as many. How many days did David work?
11. At 10 cents a box, what is the cost of 4 boxes of strawberries?
12. If one ounce equals 8 drams, how many drams do 5 ounces equal?
13. A boy had 11 cents and his father gave him 4 times as many. How much did his father give him?
14. What is the cost of 5 tons of hay at \$9 a ton?
15. At 12 cents a pound, what is the cost of 4 pounds of sugar?
16. At 10 cents an hour, how much can a boy earn in 5 hours?
17. What is the cost of 5 sheep at \$11 each?
18. If 1 foot equals 12 inches, how many inches do 5 feet equal?
19. What is the cost of 5 chairs at \$12 each?

REVIEW OF THE FACTS.

LESSON LXXV.

How many 2's are there in 6? 8's in 6? 2's in 8? 4's in 8? 3's in 9? 2's in 10? 5's in 10? 2's in 12? 3's in 12? 4's in 12? 8's in 15? 5's in 15?

How many 2's equal 14? 2's equal 16? 4's equal 16? 2's equal 18? 8's equal 18? 2's equal 20? 4's equal 20? 5's equal 20? 2's equal 22? 2's equal 24? 8's equal 24? 4's equal 24?

27 equals how many 3's? 28 how many 4's? 30 how many 3's? 30 how many 5's? 32 how many 4's? 33 how many 3's? 35 how many 5's? 36 how many 3's? 36 how many 4's?

How many times 4 is 40? 5 is 40? 4 is 44? 5 is 45? 4 is 48? 5 is 50? 5 is 55? 5 is 60?

LESSON LXXVI.

$\frac{1}{2}$ of 4 is what? $\frac{2}{3}$ of 4? $\frac{1}{3}$ of 6? $\frac{1}{3}$ of 6? $\frac{2}{3}$ of 6?
 $\frac{3}{4}$ of 6? $\frac{1}{2}$ of 8?

$\frac{1}{4}$ of 8 is what? $\frac{2}{3}$ of 8? $\frac{3}{4}$ of 8? $\frac{1}{4}$ of 8? $\frac{1}{3}$ of 9?
 $\frac{2}{3}$ of 9?

$\frac{1}{2}$ of 10 is what? $\frac{1}{3}$ of 10? $\frac{2}{3}$ of 10? $\frac{3}{4}$ of 10? $\frac{1}{4}$ of 10?
 $\frac{2}{3}$ of 10?

$\frac{1}{4}$ of 12 is what? $\frac{1}{3}$ of 12? $\frac{2}{3}$ of 12? $\frac{1}{4}$ of 12? $\frac{2}{3}$ of 12?
 $\frac{3}{4}$ of 12?

$\frac{1}{2}$ of 14 is what? $\frac{1}{3}$ of 15? $\frac{2}{3}$ of 15? $\frac{1}{4}$ of 15? $\frac{1}{2}$ of 16?
 $\frac{1}{4}$ of 16 is what? $\frac{2}{3}$ of 16? $\frac{3}{4}$ of 16? $\frac{1}{4}$ of 18?

$\frac{1}{3}$ of 18 is what? $\frac{2}{3}$ of 18? $\frac{1}{4}$ of 20? $\frac{2}{3}$ of 20? $\frac{3}{4}$ of 20?
 $\frac{1}{4}$ of 20 is what? $\frac{2}{3}$ of 20? $\frac{3}{4}$ of 20? $\frac{1}{4}$ of 21?

$\frac{2}{3}$ of 21?

$\frac{1}{2}$ of 22 is what? $\frac{1}{3}$ of 24? $\frac{2}{3}$ of 24? $\frac{1}{4}$ of 24? $\frac{2}{3}$ of 24?
 $\frac{3}{4}$ of 24?

LESSON LXXX.

What is the $\frac{1}{2}$ of 25? $\frac{2}{3}$ of 25? $\frac{3}{4}$ of 25? $\frac{4}{5}$ of 25? $\frac{1}{3}$ of 27?
 $\frac{2}{3}$ of 27? $\frac{1}{4}$ of 28? $\frac{2}{5}$ of 28? $\frac{3}{4}$ of 28?

What is the $\frac{1}{2}$ of 30? $\frac{2}{3}$ of 30? $\frac{1}{4}$ of 30? $\frac{3}{5}$ of 30? $\frac{2}{3}$ of 30?
 $\frac{4}{5}$ of 30?

What is the $\frac{1}{4}$ of 32? $\frac{2}{3}$ of 32? $\frac{3}{4}$ of 32? $\frac{1}{3}$ of 33? $\frac{2}{3}$ of 33?

What is the $\frac{1}{2}$ of 35? $\frac{2}{3}$ of 35? $\frac{3}{4}$ of 35? $\frac{4}{5}$ of 35? $\frac{1}{3}$ of 36?
 $\frac{2}{3}$ of 36?

What is the $\frac{1}{4}$ of 36? $\frac{2}{3}$ of 36? $\frac{3}{4}$ of 36? $\frac{1}{5}$ of 40? $\frac{2}{3}$ of 40?
 $\frac{3}{4}$ of 40?

What is the $\frac{1}{2}$ of 40? $\frac{2}{3}$ of 40? $\frac{3}{4}$ of 40? $\frac{4}{5}$ of 40? $\frac{1}{3}$ of 44?
 $\frac{2}{3}$ of 44? $\frac{3}{4}$ of 44?

What is the $\frac{1}{2}$ of 45? $\frac{2}{3}$ of 45? $\frac{3}{4}$ of 45? $\frac{4}{5}$ of 45?
 $\frac{1}{3}$ of 48? $\frac{2}{3}$ of 48? $\frac{3}{4}$ of 48?

What is the $\frac{1}{2}$ of 50? $\frac{2}{3}$ of 50? $\frac{3}{4}$ of 50? $\frac{4}{5}$ of 50?
 $\frac{1}{3}$ of 55? $\frac{2}{3}$ of 55? $\frac{3}{4}$ of 55? $\frac{4}{5}$ of 55?

What is the $\frac{1}{2}$ of 60? $\frac{2}{3}$ of 60? $\frac{3}{4}$ of 60? $\frac{4}{5}$ of 60?

LESSON LXXXI.

$\frac{1}{2}$ of what is 2? $\frac{1}{2}$ of what is 4? $\frac{1}{2}$ of what is 6? $\frac{1}{2}$ of what is 8?

$\frac{1}{2}$ of what is 9? $\frac{1}{2}$ of what is 11? $\frac{1}{2}$ of what is 12?
 $\frac{2}{3}$ of what is 12?

$\frac{1}{2}$ of what is 6? $\frac{1}{2}$ of what is 7? $\frac{1}{2}$ of what is 10? $\frac{1}{2}$ of what is 12?

$\frac{2}{3}$ of what is 4? $\frac{2}{3}$ of what is 8? $\frac{2}{3}$ of what is 12? $\frac{2}{3}$ of what is 12?

$\frac{1}{4}$ of what is 5? $\frac{1}{4}$ of what is 7? $\frac{1}{4}$ of what is 9? $\frac{1}{4}$ of what is 11?

$\frac{3}{4}$ of what is 6? $\frac{3}{4}$ of what is 9? $\frac{3}{4}$ of what is 12? $\frac{3}{4}$ of what is 16?

$\frac{2}{5}$ of what is 7? $\frac{2}{5}$ of what is 9? $\frac{2}{5}$ of what is 12? $\frac{2}{5}$ of what is 16?

LESSON LXXIX.

1 yard = 3 feet. | 12 inches = 1 foot. | 1 inch = $\frac{1}{12}$ foot.
 1 foot = 12 inches. | 3 feet = 1 yard. | 1 foot = $\frac{1}{3}$ yard.

2 yards equal how many feet? 3 yards? 4 yards?
 5 yards?

6 feet equal how many yards? 9 feet? 12 feet? 15 feet?
 18 feet? 24 feet? 27 feet? 36 feet?

$\frac{1}{3}$ of 8 feet is what? $\frac{1}{3}$ of 1 yard equals what? 2 yards?
 3 yards? 4 yards? 6 yards? 9 yards? 12 yards?

2 feet equal how many inches? 8 feet? 4 feet? 5 feet?

LESSON LXXX.

1 gallon = 4 quarts. | 2 pints = 1 quart. | 1 pint = $\frac{1}{2}$ quart.
 1 quart = 2 pints. | 4 quarts = 1 gallon. | 1 quart = $\frac{1}{4}$ gallon.

2 gallons equal how many quarts? 3 gallons? 4 gallons?
 5 gallons?

8 quarts equal how many gallons? 12 quarts? 16 quarts?
 24 quarts? 32 quarts? 36 quarts? 48 quarts?

$\frac{1}{4}$ of 4 quarts is what? $\frac{1}{4}$ of 1 gallon equals what? 2 gallons?
 3 gallons? 5 gallons? 7 gallons? 9 gallons? 12 gallons?

2 quarts equal how many pints? 3 quarts? 4 quarts?
 5 quarts?

4 pints equal how many quarts? 6 pints? 8 pints?
 12 pints? 14 pints? 16 pints? 18 pints? 22 pints?
 24 pints?

$\frac{1}{2}$ of 2 pints is what? $\frac{1}{2}$ of 1 quart is what? 2 quarts?
 3 quarts? 5 quarts? 8 quarts? 10 quarts? 12 quarts?

LESSON LXXXI.

1 year=12 months.

1 year=52 weeks.

1 week=7 days.

1 day=24 hours.

1 hour=60 minutes.

1 minute=60 seconds.

60 seconds=1 minute.

60 minutes=1 hour.

24 hours=1 day.

7 days=1 week.

52 weeks=1 year.

12 months=1 year.

2 years equal how many months? 3 years? 4 years?
 5 years?

$\frac{1}{2}$ of 12 months is how many months? $\frac{1}{4}$ of a year is how many months?

$\frac{1}{3}$ of a year is how many months? $\frac{2}{3}$ of a year? $\frac{1}{4}$ of a year?
 $\frac{2}{4}$ of a year? $\frac{3}{4}$ of a year?

2 weeks equal how many days? 3 weeks? 4 weeks?
 5 weeks?

$\frac{1}{2}$ of 24 hours is how many hours? $\frac{1}{2}$ of a day is how many hours?

$\frac{1}{3}$ of a day is how many hours? $\frac{2}{3}$ of a day? $\frac{1}{4}$ of a day?
 $\frac{2}{4}$ of a day? $\frac{3}{4}$ of a day?

$\frac{1}{2}$ of 60 minutes is how many minutes? $\frac{1}{2}$ of an hour is how many minutes? $\frac{2}{2}$ of an hour? $\frac{3}{3}$ of an hour? $\frac{4}{4}$ of an hour?

$\frac{1}{3}$ of 60 seconds is how many seconds? $\frac{1}{3}$ of a minute is how many seconds? $\frac{2}{3}$ of a minute? $\frac{3}{3}$ of a minute? $\frac{4}{4}$ of a minute?

1 foot equals what part of 1 yard? What part of 2 yards?

1 inch equals what part of 1 foot? 2 inches? 3 inches?
 4 inches?

1 pint equals what part of 1 quart? 1 quart equals what part of 1 gallon? 2 quarts?

1 month equals what part of 1 year? 2 months?
 3 months? 4 months?

LESSON LXXXII.

1. What is the cost of $\frac{1}{2}$ of a ton of coal if 1 ton costs \$6?
2. How much should be paid for $\frac{1}{2}$ of a yard of velvet if 1 yard costs \$8?
3. If a quantity of flour costs \$18, what is the cost of $\frac{1}{2}$ of the quantity?
4. If a man can walk 24 miles one day, how far can he walk in $\frac{1}{2}$ of a day?
5. What is the cost of $\frac{1}{2}$ of a cord of wood, if one cord costs \$12?
6. James has \$18 and Joe has $\frac{1}{2}$ as much. How much money has Joe?
7. John's father can earn \$24 a week, and he can earn $\frac{1}{2}$ as much? How much can John earn a week?
8. If it costs 36 cents to ride a certain distance, what is the cost of riding $\frac{1}{2}$ as far?
9. What is the value of $\frac{1}{4}$ of an acre of land if one acre costs \$20?
10. If an engine runs 28 miles in one hour, how far does it run in $\frac{1}{2}$ of an hour?
11. How much board does a man pay for $\frac{1}{2}$ of a month if he pays \$32 for one month?
12. If a man receives \$48 for digging a trench, how much does he receive for $\frac{1}{2}$ of the work?
13. Mr. A. is 80 years of age and his son is $\frac{1}{2}$ as old. How old is the son?
14. Mr. B. pays for rent \$35 a month. How much does he pay for $\frac{1}{2}$ of a month?
15. James wrote 45 words, $\frac{1}{5}$ of which are misspelled. How many were misspelled?
16. During a storm it rained one hour and hailed $\frac{1}{6}$ as long. How many minutes did it hail?

LESSON LXXXIII.

How many times

2 pints are 4 pints?
 2 pints are 6 pints?
 3 pints are 6 pints?
 2 quarts are 8 quarts?
 4 quarts are 8 quarts?
 3 gallons are 9 gallons?
 2 apples are 10 apples?
 5 apples are 10 apples?
 2 melons are 12 melons?
 8 melons are 12 melons?
 4 melons are 12 melons?

How many times

2 balls are 14 balls?
 3 balls are 15 balls?
 5 balls are 15 balls?
 2 dollars are 16 dollars?
 4 dollars are 16 dollars?
 2 peaches are 18 peaches?
 8 peaches are 18 peaches?
 2 cherries are 20 cherries?
 4 cherries are 20 cherries?
 5 cherries are 20 cherries?
 8 plums are 21 plums?

LESSON LXXXIV.

How many times are

2 quinces in 22 quinces?
 2 pears in 24 pears?
 3 pears in 24 pears?
 4 pears in 24 pears?
 5 feet in 25 feet?
 8 inches in 27 inches?
 4 miles in 28 miles?
 8 years in 80 years?
 5 years in 80 years?
 4 days in 32 days?
 8 hours in 88 hours?

How many times are

5 yards in 85 yards?
 3 pounds in 86 pounds?
 4 pounds in 86 pounds?
 4 acres in 40 acres?
 5 acres in 40 acres?
 4 lemons in 44 lemons?
 5 dates in 45 dates?
 4 corks in 48 corks?
 5 cents in 50 cents?
 5 acorns in 55 acorns?
 5 boxes in 60 boxes?

LESSON LXXXV.

1. At \$6 a yard, what is the cost of 2 yards of velvet?
2. If two yards of velvet cost \$12, what is the cost of one yard?
3. At \$2 a yard how many yards of cloth can be bought for \$12.
4. If a boy can earn \$8 each week, how much can he earn in 3 weeks?
5. If \$24 can be earned in 3 weeks, how much can be earned in one week?
6. At \$8 a day, in how many days can a man earn \$24?
7. If one ton of coal cost \$7, what is the cost of 4 tons?
8. If 4 tons of coal cost \$28, what is the cost of one ton?
9. At 4 miles an hour, in how many hours can a man walk 28 miles?
10. If one sheep cost \$9, what is the cost of 5 sheep?
11. If 5 sheep cost \$45, what is the cost of one sheep?
12. At 5 cents each, how many pencils can be bought for 45 cents?
13. How many oranges at 4 cents each can be bought for 24 cents?
14. If 8 tops cost 21 cents, what is the cost of one top?
15. How many ounces of drugs at \$2 an ounce, can be bought for \$14?
16. If 4 dozen of eggs cost 28 cents, what is the cost of one dozen?
17. At \$8 a yard, how many yards of silk can be bought for \$27?
18. If 5 boys earn \$35, how much does each boy earn?
19. At \$5 a barrel, how many barrels of flour cost \$30?

LESSON LXXXVI.

1. At \$2 a pair, how many pairs of skates cost \$24?
2. If 2 pounds equal 24 ounces, how many ounces does one pound equal?
3. Since 4 quarts equal one gallon, how many gallons do 48 quarts equal?
4. At 5 cents a yard, how many yards of tape cost 60 cents?
5. If 8 bunches of radishes cost 12 cents, what is the cost of 1 bunch?
6. At \$8 a head, how many head of sheep can be bought for \$18?
7. At 4 cents each, how many oranges can be bought for 28 cents?
8. If 4 lemons cost 82 cents, what is the cost of 1 lemon?
9. What is the cost of 1 paper of needles if 5 papers cost 85 cents?
10. How many bunches of grapes, at 5 cents each, can be bought for 40 cents?
11. Paid \$24 for 8 head of sheep. What is the cost of each head?
12. If 4 quarts of molasses cost 86 cents, what is the cost of 1 quart?
13. If 5 tons of hay cost \$60, what is the cost of 1 ton?
14. How many quarts of oil, at 3 cents a quart, can be bought for 86 cents?
15. Since 4 pecks equal 1 bushel, how many bushels do 44 pecks equal?
16. At \$5 a day, in how many days can a man earn \$60?

LESSON LXXXVII.

1. If 2 men can do a piece of work in 4 days, in what time can 1 man do it?
2. If 1 man can make a sled in 15 days, in what time can 3 men make it?
3. In what time can 1 man dig a ditch, if 4 men can dig it in 6 days?
4. In what time can 5 men mow a field of grass, if 1 man can do it in 40 days?
5. If 2 boys can earn a certain sum in 9 days, in what time can 1 boy earn it?
6. In what time can 3 men build a fence, if 1 man can build it in 2 days?
7. In what time can 1 man lay a stone wall, if 4 men can lay it in 9 days?
8. If 5 persons consume a barrel of cider in 10 days, in what time can 1 man drink it?
9. If 1 man can drink a quantity of tea in 36 days, how long will it last 3 men?
10. In what time can 1 boy build a dam, if 4 boys can do it in 12 days?
11. In what time can 5 men earn a given sum of money, if 1 man can earn it in 60 days?
12. If 1 man can do a piece of work in 4 days, what part of it can he do in 1 day? In 2 days?
13. If a ship sails a certain distance in 6 days, what part of the distance does it sail in 1 day? In 2 days? In 8 days?
14. What part of a fence can a man build in 1 day, if he can build it all in 8 days? What part in 2 days? In 4 days?
15. What part of a barrel of flour does a family consume in 1 week, if they consume it all in 10 weeks? What part in 2 weeks? In 5 weeks?

LESSON LXXXVIII.

TEACHER. What number equals 8 times 4? PUPIL. 12 equals 8 times 4.

T. What number equals 4 times 3? P. 12 equals 4 times 3.

T. Because 12 equals 3 times 4, or 4 times 3, it is the product of 3 and 4.

T. What is the product of 8 and 5? P. 15 is the product of 8 and 5.

What is the product of 2 and 3? 2 and 4? 3 and 3?
2 and 5? 2 and 6? 3 and 4? 2 and 7? 3 and 5? 2 and 8?

What is the product of 4 and 4? 2 and 9? 8 and 6?
2 and 10? 4 and 5? 3 and 7? 2 and 11? 2 and 12?
8 and 8?

What is the product of 4 and 6? 5 and 5? 8 and 9?
4 and 7? 3 and 10? 5 and 6? 4 and 8? 3 and 11?
5 and 7?

What is the product of 3 and 12? 4 and 9? 4 and 10?
5 and 8? 4 and 11? 5 and 9? 4 and 12? 5 and 11?
5 and 12?

LESSON LXXXIX.

PENCIL EXERCISES. PRODUCTS.

LESSON XC.

TEACHER. How many 2's are there in 6? PUPIL. Three 2's are in 6.

T. How many times is 2 contained in 6? P. 2 is contained 3 times in 6.

T. Because three 2's are in 6, or 2 is contained 3 times in 6, 3 is the quotient of 6 and 2.

T. What is the quotient of 6 and 3? P. Two is the quotient of 6 and 3.

What is the quotient of 8 and 2? 8 and 4? 9 and 3?
10 and 2? 10 and 5? 12 and 2? 12 and 3? 12 and 4?

What is the quotient of 14 and 2? 15 and 3? 15 and 5?
16 and 4? 18 and 2? 18 and 3? 20 and 2? 20 and 4?

What is the quotient of 20 and 5? 21 and 3? 22 and 2?
24 and 2? 24 and 3? 24 and 4? 25 and 5? 27 and 3?

What is the quotient of 28 and 4? 30 and 3? 30 and 5?
32 and 3? 33 and 3? 35 and 5? 36 and 3? 36 and 4?

What is the quotient of 30 and 3? 30 and 5? 32 and 4?
40 and 4? 40 and 5? 44 and 4? 45 and 5? 48 and 4?

LESSON XCI.

PENCIL EXERCISES.

Quotient.

2)4	2)6	3)6	2)8	4)8	3)9	2)10	5)10
2)12	3)12	4)12	2)14	3)15	5)15	2)16	4)16
2)18	3)18	2)20	4)20	5)20	3)21	2)22	2)24
3)24	4)24	5)25	3)27	4)28	3)30	5)30	4)32
3)33	5)35	3)36	4)36	4)40	5)40	4)44	5)45
4)48	5)50	5)55	5)60				

LESSON XCII.

WRITTEN WORK.

SUM.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1	2	8	4	1	1	1	2	8	2
2	1	1	1	2	8	2	1	2	4
3	1	1	2	8	2	4	8	8	2
1	2	2	1	1	2	1	2	2	4
2	2	1	2	4	4	5	5	5	5

11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1	2	2	8	8	8	4	4	5	5
3	3	4	4	5	4	8	4	4	4
4	4	8	2	8	5	4	8	8	5
2	3	4	8	4	6	8	3	3	4
5	5	5	5	5	4	5	5	4	4

21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
1	2	8	4	4	4	4	4	5	5
2	4	8	3	4	4	3	5	5	4
3	8	2	1	2	5	4	4	4	5
4	2	4	5	2	8	5	5	4	4
2	1	5	3	5	8	4	4	5	5
5	4	3	3	5	5	3	5	5	4

31.	32.	33.	34.	35.	36.	37.	38.
12	21	11	22	12	13	15	24
21	12	22	83	81	22	41	32
23	82	83	11	13	14	23	15
81	18	81	18	82	41	81	51
18	81	18	81	23	82	14	24
22	82	82	12	22	23	21	33

LESSON XCIII.

SUM.

1.	2.	3.	4.	5.	6.	7.	8.
52	22	82	22	88	40	82	14
25	83	18	11	12	15	15	51
84	11	41	54	21	28	50	18
12	44	15	83	41	81	84	31
21	18	22	21	50	42	21	12
83	41	81	12	24	85	85	21
22	25	14	55	82	22	51	45

9.	10.	11.	12.	13.	14.
128	218	828	528	258	812
812	821	142	412	812	244
281	182	821	845	411	425
142	245	582	128	185	248
284	814	225	814	522	812
148	281	845	451	248	258
815	128	821	128	451	804
258	512	548	485	824	450

15.	16.	17.	18.	19.	20.
421	841	415	404	811	514
248	214	280	250	188	182
824	852	854	818	228	854
152	118	118	142	415	118
418	881	821	814	152	881
802	214	214	152	814	124
248	158	142	415	142	142
824	205	828	822	818	828
158	518	454	188	250	808
418	242	808	811	404	454

LESSON XCIV.

SUM.

1.	2.	3.	4.	5.
1284	4821	5482	8214	2485
2841	8214	4825	2148	5842
8412	2184	8245	1492	8081
4128	1482	2548	4821	1584
1285	5218	1284	8254	4123
<u>2351</u>	<u>2354</u>	<u>4821</u>	<u>4818</u>	<u>8542</u>
6.	7.	8.	9.	10.
8452	2584	8245	4344	5445
2818	8142	4582	5544	4554
9452	4528	2844	8154	5454
8214	2134	4821	5543	4545
2549	4948	8245	9445	4444
4281	2582	2821	8584	5555
2485	8144	5454	5448	4545
5232	4522	8282	5834	5454
8424	2888	4114	8445	4545
<u>4332</u>	<u>4455</u>	<u>8558</u>	<u>4885</u>	<u>5454</u>
11.	12.	13.	14.	15.
4352	5824	5884	5484	4444
3243	4848	8552	8252	5555
8421	5215	4285	2818	8884
5253	1458	8421	4258	5435
3445	2582	4845	8584	4553
5845	5344	8254	5234	5435
4584	8428	4528	2458	4854
8452	5254	8254	8883	5444
4825	4545	4554	4444	4555
<u>5433</u>	<u>5884</u>	<u>5555</u>	<u>5555</u>	<u>5555</u>

LESSON XCV.

DIFFERENCE.—WRITTEN WORK.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
23	24	82	84	42	51	52	50	52	61
12	11	14	15	23	38	35	32	34	34

11.	12.	13.	14.	15.	18.	17.	18.	19.	20.
62	61	61	62	70	71	78	72	68	58
28	35	85	48	48	44	45	34	85	85

21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
72	71	72	78	70	81	81	80	80	82
58	23	84	25	24	22	24	35	28	28

31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
88	88	88	88	90	90	90	90	91	91
24	85	45	54	18	22	84	48	24	15

41.	42.	43.	44.	45.	46.	47.	48.	49.	50.
91	91	91	91	92	92	98	98	94	94
24	42	84	48	54	45	84	44	55	45

51.	52.	53.	54.	55.	56.	57.	58.
101	101	102	102	103	103	104	104
48	45	84	85	44	45	45	55

LESSON XCVI.

1.	2.	3.	4.	5.	6.	7.	8.
821	822	428	431	522	532	528	512
182	128	284	248	284	245	245	254

9.	10.	11.	12.	13.	14.	15.	16.
518	622	612	632	610	618	621	602
245	844	855	444	855	454	855	885

17.	18.	19.	20.	21.	22.	23.	24.
622	621	722	712	720	718	712	711
493	485	845	494	445	545	454	544

25.	26.	27.	28.	29.	30.	31.	32.
722	723	714	603	921	732	720	702
555	545	825	495	455	555	854	584

33.	34.	35.	36.	37.	38.	39.	40.
811	812	821	810	801	821	832	848
483	448	844	583	583	455	554	855

41.	42.	43.	44.	45.	46.	47.	48.
912	981	921	983	948	910	902	922
458	402	414	514	454	854	448	555

LESSON XCVII.

1.	2.	3.	4.	5.	6.
4821	4821	4812	4112	4082	4208
1244	2424	2418	8458	2518	2344
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

7.	8.	9.	10.	11.	12.
5201	5850	5102	5213	5321	5324
2324	8455	2348	2454	8458	2435
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

13.	14.	15.	16.	17.	18.
6204	6082	6218	6121	6821	6088
2461	8845	2845	8254	2484	8524
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

19.	20.	21.	22.	23.	24.
7210	7111	7212	7180	7218	7101
8245	8844	4825	4935	5184	5484
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

25.	26.	27.	28.	29.	30.
8121	8211	8122	8102	8280	8322
8242	8452	4844	4884	5845	5544
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

31.	32.	33.	34.	35.	36.
9211	9121	9218	9904	9280	9821
4854	4854	4845	5482	5845	5544
<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

LESSON XCVIII.

ORAL PROBLEMS.

1. A farmer sold 11 hogs to one man and 3 to another. How many did he sell to both?
2. Gave 12 cents for marbles and 4 cents for a pencil. How much was spent for both?
3. John is 13 years old and George is 5 years older. How old is George?
4. James earned 14 cents and his father gave him 4 cents. How many cents did he then have?
5. Lucy bought 16 oranges and Kittie 5 oranges. How many oranges did they both buy?
6. Sarah ate 18 chestnuts and Jane ate 4. How many did they both eat?
7. Belle is 15 years old, which is 4 years younger than Blanche. How old is Blanche?
8. Kate is 17 years old. How old will she be in 5 years more?
9. A boy had 14 cents and wanted 5 cents more than he had. How many cents did he want?
10. A girl having 19 chickens lost 4 of them by death. How many were left?
11. Paid 21 cents for a slate and 5 cents less for a book. What is the cost of the book?
12. Charles is 22 years old, which is 4 years older than Lucy. How old is Lucy?
13. John is 19 years old. How old was he 5 years ago?
14. A man having \$18 gave \$5 of it for a barrel of flour. How much was left?
15. A boy carrying two dozen eggs broke 5 of them. How many were unbroken?

LESSON XCIX.

1. If you had 22 cents, which is 4 cents less than your friend has, how many cents has your friend?
2. George traveled 28 miles and Joe 5 miles farther. How far did Joe travel?
3. Maggie wrote 24 words, which was 4 less than the number Julia wrote. How many did Julia write?
4. Lucy had 25 buttons on her dress, of which she lost 8 buttons. How many were left?
5. If A is 27 years old and 4 years older than B, how old is B?
6. Mr. Jones is 24 years old. How old was he 5 years ago?
7. I have \$27, which is \$4 less than I had yesterday. How much had I yesterday?
8. How much money has a man if he can spend \$5 and have \$28 left?
9. How many marbles has a boy, if when he receives 4 more he has 29 marbles?
10. A boy bought a knife for 28 cents and sold it for 5 cents more. How much did he get for it?
11. I have a book that cost 12 cents. If I sell it at a loss of 4 cents, how much do I get for it?
12. \$84 was paid for a shawl, which is \$4 less than the cost of a cloak. What is the cost of the cloak?
13. An article is sold for \$88, which is \$4 more than the cost of it. What was the cost of it?
14. A traveled 37 miles. How far should B travel to make a journey 4 miles farther?
15. Bought a book for 48 cents, but lacked 5 cents of having enough money to pay for it. How much money had I?
16. Mr. B. is 54 years old, which is 5 years older than his wife. How old is his wife?

LESSON C.

WRITTEN PROBLEMS.

1. Bought a pound of coffee for 28 cents and a pound of butter for 25 cents. What is the cost of both?
2. James earned 44 cents one day and 52 cents the next. How much did he earn in both days?
3. Bought a dress for \$24, a shawl for \$15, and a cloak for \$14. What was the cost of all?
4. At 32 cents a pound, how much more does a pound of coffee cost than a pound of sugar at 12 cents?
5. John had a fish line 42 feet long and cut off 25 feet of it and gave it to his brother. How much was left?
6. I have 255 sheep in one pasture, 284 in another, 334 in another. How many sheep in the three pastures?
7. A dress pattern cost \$45, the trimmings \$14, and the making of it \$18. What was the cost of the dress?
8. A man bought a watch for \$40 and sold it for \$68. How much was gained?
9. A farmer sold a horse for \$96, which is \$28 more than the cost. How much was the cost?
10. A lady has \$87. How much may she lose and yet have \$53?
11. Bought a horse for \$185, which is \$45 less than I received for him. What was the selling price?
12. Paid \$8452 for a house, \$425 for painting it, and \$2312 for furniture. How much was the entire cost?
13. Paid \$6821 for a farm, and \$2453 for a house. How much less did the house cost than the farm?
14. Arthur finds 284 nuts under one tree, 308 under another, and 54 under another. How many nuts did he find?
15. Frank finds 605 under one tree and 284 under another. How many more were found under one tree than under the other?

LESSON CI.

1. Bought 8 car loads of wheat, paying for the first \$245, for the second \$324, and for the third \$458. How much was paid for all?
2. Paid \$628 for wheat and \$254 for corn. How much more was paid for the wheat than the corn?
3. If an engine travels 245 miles each day, how far does it travel in four days?
4. A gentleman having \$881, gave over to his son \$354. How much did he retain?
5. A paid \$548 for taxes, B \$352, and C \$485. How much did they all pay?
6. A gentleman is 58 years old. How many years ago was he 25 years old?
7. A farmer has \$854. How much more does he need that he may buy a field worth \$912?
8. If a ship sails 354 miles each day, how far does it sail in six days?
9. Bought a farm for \$4553, and sold it for \$6310. How much was gained?
10. Paid \$4826 for a house, which was \$3554 less than the cost of the farm? What is the cost of the farm?
11. A man has \$2355. How much shall he add to it to buy a farm worth \$6304?
12. If a man can save \$542 each year, how much can he save in six years?
13. If a man is 632 miles from Chicago, and travels towards it 354 miles, how far is he yet from Chicago?
14. How many palings are necessary to fence a square lot if each side requires 455 palings?
15. A train traveled 235 miles in one day. How far should it travel the next day to make the distance 510 miles in the two days?

LESSON CII.

PRODUCTS.

1.	2.	3.	4.	5.	6.	7.
821	842	284	875	548	556	654
2	2	2	2	2	2	2
—	—	—	—	—	—	—
8.	9.	10.	11.	12.	13.	14.
572	736	896	854	465	527	654
2	2	2	8	3	3	8
—	—	—	—	—	—	—
15.	16.	17.	18.	19.	20.	21.
725	858	964	978	987	998	862
8	8	8	8	8	8	8
—	—	—	—	—	—	—
22.	23.	24.	25.	26.	27.	28.
456	468	562	578	634	675	754
4	4	4	4	4	4	4
—	—	—	—	—	—	—
29.	30.	31.	32.	33.	34.	35.
786	898	876	889	897	965	989
4	4	4	4	4	4	4
—	—	—	—	—	—	—
36.	37.	38.	39.	40.	41.	42.
872	889	463	482	567	598	657
5	5	5	5	5	5	5
—	—	—	—	—	—	—
43.	44.	45.	46.	47.	48.	49.
694	765	789	876	885	976	987
5	5	5	5	5	5	5
—	—	—	—	—	—	—

LESSON CIII.

PRODUCTS.

1.	2.	3.	4.	5.	6.
1234	8421	5682	4573	6285	7057
2	2	2	2	2	2
—	—	—	—	—	—
7.	8.	9.	10.	11.	12.
5068	6507	7849	8976	8568	4675
2	2	2	2	3	8
—	—	—	—	—	—
13.	14.	15.	16.	17.	18.
5063	6708	7689	7584	8509	8987
8	8	8	8	8	8
—	—	—	—	—	—
19.	20.	21.	22.	23.	24.
9086	9098	8671	4568	5675	6807
8	8	4	4	4	4
—	—	—	—	—	—
25.	26.	27.	28.	29.	30.
6895	7086	7609	8058	8607	9868
4	4	4	4	4	4
—	—	—	—	—	—
31.	32.	33.	34.	35.	36.
9976	8684	4076	5481	6887	6758
4	5	5	5	5	5
—	—	—	—	—	—
37.	38.	39.	40.	41.	42.
7893	7089	8764	8965	9768	9987
5	5	5	5	5	5
—	—	—	—	—	—

LESSON CIV.

How many are
 2 times 3854 peaches?
 2 times 5628 inches?
 2 times 8706 melons?
 3 times 4078 minutes?
 3 times 7186 gallons?
 3 times 9742 barrels?
 4 times 5965 baskets?
 4 times 7598 benches?
 4 times 9689 tables?
 5 times 4385 houses?
 5 times 6789 gallons?
 5 times 8096 ink-mills?

LESSON CV.

How many are
 2 times 4682 pencils?
 2 times 6428 dollars?
 2 times 8640 bushels?
 3 times 5397 acres?
 3 times 7589 letters?
 3 times 9875 blotters?
 4 times 4268 boxes?
 4 times 6842 wagons?
 4 times 8624 kettles?
 5 times 5793 pictures?
 5 times 7895 figures?
 5 times 9537 oranges?

LESSON CVI.

QUOTIENTS.

1. 2) <u>26</u>	2. 2) <u>28</u>	3. 2) <u>42</u>	4. 2) <u>44</u>	5. 2) <u>46</u>	6. 2) <u>48</u>	7. 2) <u>62</u>
8. 2) <u>64</u>	9. 2) <u>66</u>	10. 2) <u>68</u>	11. 2) <u>80</u>	12. 2) <u>84</u>	13. 2) <u>86</u>	14. 2, <u>88</u>
15. 3) <u>89</u>	16. 3) <u>68</u>	17. 3) <u>66</u>	18. 3) <u>69</u>	19. 3) <u>98</u>	20. 3) <u>96</u>	21. 3) <u>99</u>
22. 4) <u>80</u>	23. 4) <u>84</u>	24. 4) <u>88</u>	25. 4) <u>480</u>	26. 4) <u>804</u>	27. 5) <u>550</u>	28. 5) <u>505</u>

LESSON CVII.

QUOTIENTS.

$$\begin{array}{lllllll} 1. & 2. & 3. & 4. & 5. & 6. & 7. \\ 2) \underline{124} & 2) \underline{142} & 2) \underline{144} & 2) \underline{146} & 2) \underline{148} & 2) \underline{162} & 2) \underline{164} \end{array}$$

$$\begin{array}{lllllll} 8. & 9. & 10. & 11. & 12. & 13. & 14. \\ 2) \underline{166} & 2) \underline{168} & 2) \underline{182} & 2) \underline{184} & 2) \underline{186} & 2) \underline{188} & 2) \underline{180} \end{array}$$

$$\begin{array}{lllllll} 15. & 16. & 17. & 18. & 19. & 20. & 21. \\ 8) \underline{128} & 8) \underline{156} & 8) \underline{129} & 8) \underline{150} & 8) \underline{158} & 8) \underline{156} & 8) \underline{159} \end{array}$$

$$\begin{array}{lllllll} 22. & 23. & 24. & 25. & 26. & 27. & 28. \\ 8) \underline{180} & 8) \underline{188} & 8) \underline{186} & 8) \underline{189} & 8) \underline{210} & 8) \underline{216} & 8) \underline{219} \end{array}$$

$$\begin{array}{lllllll} 29. & 30. & 31. & 32. & 33. & 34. & 35. \\ 4) \underline{124} & 4) \underline{128} & 4) \underline{160} & 4) \underline{164} & 4) \underline{168} & 4) \underline{200} & 4) \underline{204} \end{array}$$

$$\begin{array}{lllllll} 36. & 37. & 38. & 39. & 40. & 41. & 42. \\ 4) \underline{208} & 4) \underline{244} & 4) \underline{248} & 4) \underline{284} & 4) \underline{288} & 4) \underline{324} & 4) \underline{328} \end{array}$$

$$\begin{array}{lllllll} 43. & 44. & 45. & 46. & 47. & 48. & 49. \\ 5) \underline{155} & 5) \underline{200} & 5) \underline{205} & 5) \underline{250} & 5) \underline{255} & 5) \underline{200} & 5) \underline{305} \end{array}$$

$$\begin{array}{lllllll} 50. & 51. & 52. & 53. & 54. & 55. & 56. \\ 5) \underline{850} & 5) \underline{855} & 5) \underline{400} & 5) \underline{405} & 5) \underline{455} & 5) \underline{500} & 5) \underline{505} \end{array}$$

LESSON CVIII.

QUOTIENTS.

1. 2) <u>1202</u>	2. 2) <u>1404</u>	3. 2) <u>1628</u>	4. 2) <u>1846</u>	5. 2) <u>1918</u>	6. 2) <u>1812</u>
7. 2) <u>2356</u>	8. 2) <u>3878</u>	9. 2) <u>4374</u>	10. 2) <u>5638</u>	11. 2) <u>6972</u>	12. 2) <u>7856</u>
13. 3) <u>1206</u>	14. 8) <u>1563</u>	15. 3) <u>1896</u>	16. 3) <u>2196</u>	17. 3) <u>2486</u>	18. 3) <u>2769</u>
19. 8) <u>4527</u>	20. 8) <u>5496</u>	21. 8) <u>6818</u>	22. 8) <u>6519</u>	23. 8) <u>6816</u>	24. 8) <u>7296</u>
25. 4) <u>1249</u>	26. 4) <u>1684</u>	27. 4) <u>2088</u>	28. 4) <u>2480</u>	29. 4) <u>2848</u>	30. 4) <u>3224</u>
31. 4) <u>8748</u>	32. 4) <u>4516</u>	33. 4) <u>5648</u>	34. 4) <u>6528</u>	35. 4) <u>7280</u>	36. 4) <u>8748</u>
37. 5) <u>1505</u>	38. 5) <u>2050</u>	39. 5) <u>2515</u>	40. 5) <u>8050</u>	41. 5) <u>3505</u>	42. 5) <u>4055</u>
43. 5) <u>4525</u>	44. 5) <u>5085</u>	45. 5) <u>5520</u>	46. 5) <u>6040</u>	47. 5) <u>7745</u>	48. 5) <u>9865</u>

LESSON CXIX.

What is $\frac{1}{2}$ of 246?

SUGGESTION: $\frac{1}{2}$ of 246 equals 2)246.

What is $\frac{1}{2}$ of 352? 456? 572? 658? 7648? 8864?

What is $\frac{1}{3}$ of 456? 579? 654? 768? 8460? 9576?

What is $\frac{1}{4}$ of 468? 544? 672? 968? 8564? 9564?

What is $\frac{1}{5}$ of 485? 570? 695? 780? 8655? 9750?

LESSON CX.

How many times are :

- 2 dollars in 2146 dollars?
- 2 peaches in 4564 peaches?
- 2 melons in 6782 melons?
- 8 acres in 5625 acres?
- 3 buttons in 7566 buttons?
- 8 plums in 9765 plums?
- 4 letters in 5628 letters?
- 4 miles in 6976 miles?
- 4 days in 8796 days?
- 5 rods in 5925 rods?
- 5 books in 7880 books?
- 5 berries in 9715 berries?

LESSON CXI.

- What is $\frac{1}{2}$ of 8428 dollars?
- What is $\frac{1}{2}$ of 5624 apples?
- What is $\frac{1}{2}$ of 7868 oranges?
- What is $\frac{1}{3}$ of 5868 lemons?
- What is $\frac{1}{3}$ of 7263 dates?
- What is $\frac{1}{3}$ of 9582 figs?
- $\frac{1}{4}$ of 5624 hours is what?
- $\frac{1}{4}$ of 7436 gallons is what?
- $\frac{1}{4}$ of 9884 quarts is what?
- $\frac{1}{5}$ of 4625 pecks is what?
- $\frac{1}{5}$ of 6780 cans is what?
- $\frac{1}{5}$ of 8575 cattle is what?

LESSON CXII.

How many times

- 2 horses are 8154 horses?
- 2 sheep are 5784 sheep?
- 2 pounds are 6354 pounds?
- 3 goats are 7953 goats?
- 8 nails are 9735 nails?
- 3 bushels are 8262 bushels?
- 4 dollars are 6972 dollars?
- 4 minutes are 8764 minutes?
- 4 chairs are 9352 chairs?
- 5 rails are 7645 rails?
- 5 rings are 9760 rings?
- 5 ounces are 9975 ounces?

LESSON CXIII.

How many times

- 2 cents are 7648 cents?
- 2 oranges are 9786 oranges?
- 2 houses are 8324 houses?
- 3 cords are 6585 cords?
- 3 barrels are 8763 barrels?
- 3 miles are 9765 miles?
- 4 yards are 7528 yards?
- 4 inches are 9876 inches?
- 4 acres are 8048 acres?
- 5 children are 6420 children?
- 5 women are 8545 women?
- 5 trunks are 9680 trunks?

LESSON CXIV.

ORAL PROBLEMS.

1. If one lemon cost 8 cents, what is the cost of 2 lemons?
2. What is the cost of 2 oranges at 4 cents each?
3. At 5 cents a yard, what is the cost of 2 yards of tape?
4. What is the cost of 2 pencils at 6 cents each?
5. At 3 dollars a day, how much can a man earn in 3 days?
6. If 1 gallon equals 4 quarts, how many quarts do 8 gallons equal?
7. What is the cost of 3 tops, if 1 top costs 5 cents?
8. At \$6 a ton, what is the cost of 3 tons of coal?
9. If A has 3 apples and B 4 times as many, how many has B?
10. At \$4 a yard, what is the cost of 4 yards of cloth?
11. At 5 cents a yard, what is the cost of 5 yards of tape?
12. How many eggs are in 4 nests, if there are 6 eggs in each nest?
13. What is the cost of 5 pairs of shoes at \$8 a pair?
14. James is 4 years old and John 5 times as old, how old is John?
15. At 5 cents each, what is the cost of 5 pencils?
16. What is the cost of 5 hats at \$6 each?
17. If $\frac{1}{2}$ of a yard of tape costs 4 cents, what is the cost of 1 yard?
18. What is the cost of 1 ton of coal, if $\frac{1}{2}$ of a ton costs \$4?
19. If $\frac{1}{2}$ of a melon costs 5 cents, what is the cost of 1 melon?
20. How old is Mary, if $\frac{1}{6}$ of her age is 7 years?
21. What is the cost of 2 yards of ribbon if one yard cost 6 cents?
22. If one pencil costs 7 cents, what is the cost of 2 pencils?
23. What is the cost of 2 melons if one melon cost 8 cents?

LESSON CXV.

1. If one bunch of grapes is worth 9 cents, what is the cost of 2 bunches?
2. How far can a man travel in 8 hours if he can travel 7 miles in one hour?
3. How many yards are there in 8 pieces of cloth if there are 8 yards in each piece?
4. If 8 men can do a piece of work in 9 days, in what time can one man do it?
5. If a boy can walk 12 miles each day, how far can he walk in 8 days?
6. What is the cost of 4 yards of cotton cloth, if one yard costs 7 cents?
7. A boy has 8 apples and 4 times as many peaches. How many peaches has he?
8. What is the cost of 4 quarts of oil, if one quart cost 9 cents?
9. If 4 men can mow a field of grass in 12 days, in how many days can one man mow it?
10. If one melon is worth 7 peaches, how many peaches are 5 melons worth?
11. If a man travels from his home 8 miles an hour, how far away will he be in 5 hours?
12. Mary has 5 flocks of chickens and 9 chickens in each flock. How many chickens has she?
13. If one pair of boots cost \$12, what is the cost of 5 pairs?
14. At 2 cents each how many tops cost 4 cents?
15. At 2 dimes each how many slates cost 6 dimes?
16. If 2 apples cost 8 cents, what is the cost of 1 apple?
17. How many lemons cost 10 cents, at 2 cents each?
18. If 2 tons of coal cost \$12, what is the cost of 1 ton?

LESSON CXVI.

1. At 8 miles an hour, in what time can a man walk 6 miles?
2. At \$3 a day, in what time can a man earn \$9.
3. If 8 hats cost \$12, what is the cost of 1 hat?
4. How many oranges cost 15 cents at 8 cents each?
5. If 8 sheep cost \$18, what is the cost of 1 sheep?
6. At 4 cents each, how many oranges cost 8 cents?
7. At \$4 a day, in what time can a man earn \$12?
8. If 4 oranges cost 16 cents, what is the cost of 1 orange?
9. How many pencils at 4 cents each can be bought for 28 cents?
10. If 4 men mow 24 acres of grass, how much does 1 man mow?
11. At \$5 a ton, how many tons of coal cost \$10?
12. How many bottles cost 15 cents if 1 bottle cost 5 cents?
13. If 5 caps cost \$20, what is the cost of 1 cap?
14. How many nickels equal 25 cents, if 1 nickel equals 5 cents?
15. If 1 man digs a ditch in 80 days, in what time can 5 men dig it?
16. At \$2 a bushel, how many bushels of wheat can be bought for \$14?
17. If 4 melons cost 32 cents, what is the cost of 1 melon?
18. How many cords of wood can be bought for \$86, if 1 cord costs \$4?
19. What is the cost of 1 slate, if 5 slates cost 45 cents?
20. At 4 cents each, how many pencils can be bought for 48 cents?
21. If 5 tons of coal cost \$45, what is the cost of 1 ton?
22. How many vests at \$5 each can be bought for \$60?

LESSON CXVII.

WRITTEN PROBLEMS.

1. If 1 horse cost \$124, what is the cost of 2 horses?
2. How far does a vessel sail in 2 days, if it sails 214 miles each day?
3. At \$143 an acre, what is the cost of 2 acres of ground?
4. How much can a man earn in 2 months, if he earns \$132 each month?
5. A merchant sold 125 barrels of flour one day and three times as many the next. How much did he sell the next day?
6. A owns 231 acres of land and B 8 times as much. How much does B own?
7. From B to C it is 321 miles, and 3 times as far from B to D. How far is it from B to D.
8. John has \$281 and James has 3 times as much. How much has James?
9. If an engine runs 324 miles in one day, how far does it run in 4 days?
10. The rent of a house for 1 year is \$284, what is the rent of 4 such houses?
11. Mr. A. saves \$482 each year. How much does he save in 4 years?
12. What is the cost of 4 carriages, if each carriage costs \$243?
13. What is the cost of 5 acres of ground, if 1 acre costs \$243?
14. A tourist traveled 325 miles one week, and 5 times as far the next. How far did he travel the second week?
15. A's wages are \$435 each month. What are his wages for 5 months?
16. B invested \$524 in stocks and C 5 times as much. How much did C invest?

LESSON CXVIII.

1. If an acre lot is worth \$435, what are 2 such lots worth?
2. If $\frac{1}{2}$ an acre lot is worth \$856, what is 1 acre lot worth?
3. At \$486 each, what is the cost of 2 fine sleighs?
4. If $\frac{1}{2}$ the rent of a house for a year is \$364, what is the whole rent worth?
5. At \$543 dollars each, what is the value of 3 loads of wheat?
6. What is the cost of a house, if $\frac{1}{2}$ of the cost is \$545?
7. What is the cost of 3 pianos, if 1 piano cost \$654?
8. If a ship sail 654 miles in $\frac{1}{2}$ of a week, how far does it sail in 1 week?
9. If a mill will grind 756 barrels of flour each day, how many barrels of flour will it grind in 4 days?
10. How much money has Mr. A. if $\frac{1}{4}$ of his money equals \$764?
11. What is the value of 4 notes, if each note is worth 875?
12. If $\frac{1}{4}$ of a merchant's goods is worth \$890, what are the goods worth?
13. What is the expense of running a mill 5 days, if it cost \$695 to run it one day?
14. If $\frac{1}{5}$ of the cost of a house and lot is \$786, what is the whole cost?
15. What is the cost of building 5 barns, if each barn cost \$986?
16. What is the cost of building a house, if $\frac{1}{5}$ of the cost is \$999?

LESSON CXIX.

1. At \$2 a bushel how many bushels of wheat can be bought for \$154?
2. If 2 horses are worth \$258, what is each horse worth?
3. How many acres of government land can be bought for \$296, if one acre costs \$2?
4. What is the cost of 1 carriage if 2 carriages are worth \$472?
5. At \$8 a day in what time can a man earn \$675?
6. If 1 car holds 465 bushels of coal, how much does $\frac{1}{3}$ of a car hold?
7. If a man walk 3 miles an hour, in what time can he walk 852 miles?
8. How many pages are there in 1 book, if there are 375 in 8 books of the same size?
9. At \$4 a yard, how many yards of cloth can be bought for \$2752?
10. If 4 yoke of oxen cost \$8464, what is the cost of 1 yoke?
11. Since 4 quarts equal 1 gallon, how many gallons do 3736 quarts equal?
12. If it costs \$4516 to pave 4 sidewalks, what is the cost of paving 1 sidewalk?
13. At \$5 a share, how many shares of stock can be bought for \$2965?
14. If a house cost \$8940, what is the $\frac{1}{6}$ of the cost?
15. How many cords of wood at \$5 a cord can be bought for \$2352?
16. If 5 cottages cost \$4875, what is the cost of each cottage?
17. If a merchant saves \$395 in five years, how much does he save each year?

LESSON CXX.

1. If a boy counts 2 cents each second, in what time can he count 584 cents?
2. If 2 city lots cost \$1978, what is the cost of one lot?
3. In how many days can a man save \$2850 if he saves \$2 each day?
4. How many bricks can one mason lay a day, if 2 masons can lay 5768 bricks?
5. How many bags, each holding 8 bushels, can be filled from 5769 bushels of wheat?
6. If 3 horses eat 2265 pounds of hay in 1 month, how much does 1 horse eat?
7. Mr. B paid \$6842 for government land at \$3 an acre. How much land did he buy?
8. If a boat is worth \$7853, what is $\frac{1}{3}$ of its value?
9. How many sheets of paper are required for 5848 pages, if one sheet equals 4 pages?
10. If 4 men equally own a boat worth \$6532, what is the value of each man's share?
11. If 4 yards of cloth is enough for 1 suit, 7524 yards is enough for how many suits?
12. If 8868 bricks are laid in a wall, how many are laid in $\frac{1}{4}$ of the wall?
13. At 5 pounds each can, how many cans can be filled from 7320 pounds of meat?
14. If 5 men equally share 8475 acres of land, how much does each one own?
15. At \$5 per mile how many miles of railroad can be watched for \$9320?
16. If it cost \$9875 to build 1 mile of railroad, what is the cost of building $\frac{1}{5}$ of a mile?

CHAPTER II.

In adding equal numbers of the same kind, certain *results* or *facts* are obtained, which form the basis of what is known as multiplication. These *facts* must be learned, that is, memorized by the child, and when so learned he is said to know the multiplication tables.

To learn, then, the so-called multiplication tables, is to memorize certain results of addition. It has been deemed expedient that such results should be memorized as far as twelve 12's.

The following lessons are designed to show

First, The facts to be memorized:

6,	12,	18;
7,	14,	21;
9,	18,	27;
8,	16,	24;
12,	24,	36; etc.

Second, To present such questions and examples as shall best aid the memory to do its perfect work.

LESSON I.

6	30	54
12	36	60
18	42	66
24	48	72

a. How many 6's in 12? 18? 24? 30? 36? 42? 48?
54? 60? 66? 72?

b. What is $\frac{1}{6}$ of 12? 18? 24? 30? 36? 42? 48? 54?
60? 66? 72?

c. What part of 6 is 1? Of 12 is 2? Of 18 is 3?
Of 24 is 4? Of 30 is 5? Of 36 is 6? Of 42 is 7?
Of 48 is 8? Of 54 is 9? Of 60 is 10? Of 66 is 11?
Of 72 is 12?

d. 2 is $\frac{1}{6}$ of what number? 3? 4? 5? 6? 7? 8? 9?
10? 11? 12?

1. If a barrel of flour cost \$6, what part of a barrel can be bought for \$1? \$2? \$3? \$4? \$5?

2. What part of \$6 is \$1? \$2? \$3? \$4? \$5?

3. What is $\frac{1}{6}$ of 12? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?

4. What is $\frac{1}{6}$ of 18? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?

5. What is $\frac{1}{6}$ of 24? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?

6. What is $\frac{1}{6}$ of 36? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?

7. What is $\frac{1}{6}$ of 42? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?

8. What is $\frac{1}{6}$ of 48? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$?

9. $\frac{1}{6}$ of 12 inches? 60 seconds? 24 hours? 18 quarts?

10. $\frac{1}{6}$ of \$54? 48 cents? 72 dimes? 90 nickels?

11. $\frac{1}{6}$ of 36 rods? 42 bushels? 66 marbles? 48 weeks?

LESSON II.

18 equals how many 6's?	$\frac{1}{6}$ of 12 equals what?
54 equals how many 6's?	$\frac{1}{6}$ of 42 equals what?
66 equals how many 6's?	$\frac{1}{6}$ of 72 equals what?
48 equals how many 6's?	$\frac{1}{6}$ of 24 equals what?
42 equals how many 6's?	$\frac{1}{6}$ of 54 equals what?
5 equals $\frac{1}{6}$ of what?	$\frac{1}{6}$ of what equals 9?
11 equals $\frac{1}{6}$ of what?	$\frac{1}{6}$ of what equals 7?
8 equals $\frac{1}{6}$ of what?	$\frac{1}{6}$ of what equals 11?
7 equals $\frac{1}{6}$ of what?	$\frac{1}{6}$ of what equals 8?
8 equals $\frac{1}{6}$ of what?	$\frac{1}{6}$ of what equals 12?

19 equals how many 6's? 27 equals how many 6's?

SUGGESTION: $19=6+6+6+1$. ∴ 19—three 6's and 1.
 $27=6+6+6+6+3$. ∴ 27—four 6's and 3.

20 is how many 6's?	How many 6's in 19?
38 is how many 6's?	How many 6's in 27?
40 is how many 6's?	How many 6's in 34?
48 is how many 6's?	How many 6's in 39?
47 is how many 6's?	How many 6's in 45?
56 is how many 6's?	How many 6's in 59?
65 is how many 6's?	How many 6's in 68?
75 is how many 6's?	How many 6's in 78?
$\frac{1}{6}$ of 18 is how many 1's?	$\frac{1}{6}$ of 24 is how many 2's?
$\frac{1}{6}$ of 36 is how many 3's?	$\frac{1}{6}$ of 42 is how many 1's?
$\frac{1}{6}$ of 48 is how many 4's?	$\frac{1}{6}$ of 54 is how many 3's?
$\frac{1}{6}$ of 60 is how many 5's?	$\frac{1}{6}$ of 72 is how many 6's?

LESSON III.

1. What do 5 oranges cost at 6 cents apiece?
2. What will 9 sheep cost at \$6 a head?
3. When you have 6 lessons each day, how many lessons do you have in 5 days?
4. What is the cost of a dozen boxes of matches at 6 cents a box?
5. A man works 6 days in each week. How many days does he work in 7 weeks? In 4 weeks? In 8 weeks?
6. If 7 men can do a piece of work in 6 days, how long will it take one man to do it?
7. What do 11 barrels of pork cost at \$6 a barrel?
8. If 10 men can build a wall in 6 days, in how many days can one man do it?
9. How many miles can a man walk in 6 hours, at the rate of 6 miles an hour?
10. If the interest of \$1 is 6 cents, what is the interest of \$10?
11. Cost of 10 barrels of flour at \$6 a barrel?
12. Cost of 20 sheep at \$6 a head?
13. Cost of planting 80 trees at \$6 each?
14. Cost of 40 slates at 6 cents apiece?
15. At \$50 a month, what does a clerk earn in six months?
16. How many lbs. of sugar in 6 tubs of 60 lbs. each?
17. How many lbs. of cheese are there in six cheeses, each weighing 70 lbs.?
18. As many dollars were paid for a ton of hay as there are 6's in 84. What was the cost of the hay?
19. How many cents are there in 6 dollars?
20. How many cents are there in 60 dimes?

LESSON IV.

1. At \$6 a barrel for flour, how many barrels can be bought for \$36? \$42? \$60? \$72?

2. When 6 barrels of flour cost \$36, what is the price of one barrel?

SUGGESTION. At \$6 a barrel as many barrels can be bought for \$36 as there are 6's in 36. 36 equals six 6's. Therefore 6 barrels can be bought.

When 6 barrels of flour cost \$36 one barrel costs one-sixth of \$36, or \$6.

3. At 6 cents a quart how many quarts of oil can be bought for 54 cents?

4. When 6 quarts of oil cost 80 cents, what is the price per quart?

5. There are 48 trees in 6 equal rows. How many trees in each row?

6. In an orchard the trees are planted in rows. There are 6 trees in each row. How many rows must there be to contain 24 trees? 60 trees? 54 trees? 80 trees?

7. The interest of \$6 is 42 cents. Interest of \$1?

8. In 6 windows there are 36 panes of glass. How many panes in each window?

9. If a man walk 6 miles an hour, in how many hours can he walk 24 miles? 72 miles? 60 miles?

10. At 6 cents apiece, how many drawing pencils can be bought for 54 cents? 48 cents? 66 cents?

11. What is the cost of $\frac{1}{6}$ of a ton of hay, when hay is selling at \$18 a ton?

12. Cost of $\frac{1}{6}$ of a bbl. of flour at \$9 a barrel?

13. At \$120 for 6 calves, what is the cost of one?

14. There are 6 working days in a week. How many weeks in 42 working days? 420? 86? 860? 54? 540?

15. If for \$1 you can buy 6 yards of muslin, what will 12 yds. cost? 18 yds.? 24 yds.? 30 yds.? 42 yds.?

LESSON V.

7	85	63
14	42	70
21	49	77
28	56	84

a. How many 7's in 14? 21? 28? 35? 42? 49? 56?
63? 70? 77? 84?

b. What is $\frac{1}{7}$ of 14? 21? 28? 35? 42? 49? 56? 63?
70? 77? 84?

c. What part of 7 is 1? Of 14 is 2? Of 21 is 3?
Of 28 is 4? Of 35 is 5? Of 42 is 6? Of 49 is 7?
Of 56 is 8? Of 63 is 9? Of 70 is 10? Of 77 is 11?
Of 84 is 12?

d. 2 is $\frac{1}{7}$ of what number? 8? 4? 5? 6? 7? 8? 9?
10? 11? 12?

14 equals how many 7's?

28 equals how many 7's?

42 equals how many 7's?

63 equals how many 7's?

$\frac{1}{7}$ of 70 equals what?

$\frac{1}{7}$ of 42 equals what?

$\frac{1}{7}$ of 84 equals what?

$\frac{1}{7}$ of 35 equals what?

5 equals $\frac{1}{7}$ of what?

7 equals $\frac{1}{7}$ of what?

4 equals $\frac{1}{7}$ of what?

1 equals $\frac{1}{7}$ of what?

56 equals how many 7's?

85 equals how many 7's?

84 equals how many 7's?

49 equals how many 7's?

$\frac{1}{7}$ of 77 equals what?

$\frac{1}{7}$ of 28 equals what?

$\frac{1}{7}$ of 63 equals what?

$\frac{1}{7}$ of 49 equals what?

8 equals $\frac{1}{7}$ of what?

6 equals $\frac{1}{7}$ of what?

9 equals $\frac{1}{7}$ of what?

8 equals $\frac{1}{7}$ of what?

LESSON VI.

1. $\frac{1}{7}$ of 14 bushels? 21 books? 85 slates? 68 gallons?2. $\frac{1}{7}$ of \$49? 70 cents? 56 years? 28 horses? 7 cups?3. $\frac{1}{7}$ of 70 feet? 84 feet? 91 feet? 77 feet?4. $\frac{1}{7}$ of 140 pecks? 210 quarts? 850 pints?

5. There are 7 days in a week. What part of a week is 1 day? 2 days? 3 days? 4 days? 5 days? 6 days?

6. What is $\frac{1}{7}$ of 7 days? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?7. What is $\frac{1}{7}$ of 14 hours? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?8. What is $\frac{1}{7}$ of 85 weeks? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?9. What is $\frac{1}{7}$ of 63 months? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?10. What is $\frac{1}{7}$ of 21 years? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?11. What is $\frac{1}{7}$ of 28 cents? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?12. What is $\frac{1}{7}$ of 42 oranges? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?13. What is $\frac{1}{7}$ of 49 pears? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?14. What is $\frac{1}{7}$ of 56 peaches? $\frac{2}{7}$? $\frac{3}{7}$? $\frac{4}{7}$? $\frac{5}{7}$? $\frac{6}{7}$?

15. How many 7's in 15? 19? 28? 27? 29? 82?

16. How many 7's in 20? 30? 40? 50? 60? 80?

17. How many 7's in 22? 31? 38? 46? 51? 58?

18. How many 7's in 18? 41? 62? 88? 47? 55?

19. How many 7's in 75? 78? 85? 90? 75? 98?

20. How many 7's in 280? 630? 560? 490? 140?

LESSON VII.

1. What will 5 barrels of flour cost at \$7 a barrel?
2. How many days are there in 4 weeks? 7 weeks?
3. With 7 desks in each row, how many desks in a room with 8 rows? 9 rows?
4. At \$7 a head, what will 6 sheep cost?
5. At 7 cents a quart, what will 9 quarts of milk cost?
6. 8 boys have 7 marbles each. How many marbles does that make?
7. 9 girls have, each, a jumping rope 7 feet long. What is the length of the 9 ropes?
8. What cost 6 tons of hay at \$7 a ton?
9. If a boy pick 7 quarts of cherries in an hour, how many quarts can he pick from 8 o'clock till noon?
10. In a certain school there are 12 benches. On each bench there are 7 boys. How many boys in the school?
11. At \$7 each, how many sheep will \$56 buy?
12. At \$56 for 7 sheep, what is the price of one sheep?
13. Paid 84 cents for 7 dozen eggs. Price per dozen?
14. John has 56 cents. His sister has $\frac{1}{4}$ as many. How many have both?
15. Charles has $\frac{1}{4}$ of 28 cents, and Mary has $\frac{1}{4}$ of 85 cents. How many more cents has Mary than Charles?
16. At the rate of 7 miles an hour, in how many hours can a man walk 49 miles? 63 miles? 56 miles? 21 miles?
17. A man works 7 hours each day. How many days will he require to do 77 hours' work? 84 hours' work?
18. If you pay 63 cents for a 7-mile ride, what is the price per mile?
19. Paid \$42 for wood at \$7 a cord. How many cords were purchased?
20. If 7 men can pave a block in 10 days, how many men would it take to do the same work in 1 day?

LESSON VIII.

8	40	72
16	48	80
24	56	88
32	64	96

a. How many 8's in 16? 24? 32? 40? 48? 56? 64?
 72? 80? 88? 96?

b. What is $\frac{1}{8}$ of 8? 16? 24? 32? 40? 48? 56? 64?
 72? 80? 88? 96?

c. What part of 8 is 1? Of 16 is 2? Of 24 is 3?
 Of 32 is 4? Of 40 is 5? Of 48 is 6? Of 56 is 7?
 Of 72 is 9?

d. 2 is $\frac{1}{8}$ of what number? 3? 4? 5? 6? 7? 8? 9?
 10? 11? 12?

40 equals how many 8's?

48 equals how many 8's?

56 equals how many 8's?

88 equals how many 8's?

72 equals how many 8's?

82 equals how many 8's?

24 equals how many 8's?

16 equals how many 8's?

96 equals how many 8's?

64 equals how many 8's?

$\frac{1}{8}$ of 8 equals what?

$\frac{1}{8}$ of 80 equals what?

$\frac{1}{8}$ of 32 equals what?

$\frac{1}{8}$ of 72 equals what?

$\frac{1}{8}$ of 48 equals what?

$\frac{1}{8}$ of 96 equals what?

$\frac{1}{8}$ of 64 equals what?

$\frac{1}{8}$ of 16 equals what?

$\frac{1}{8}$ of 40 equals what?

$\frac{1}{8}$ of 88 equals what?

8 equals $\frac{1}{8}$ of what?

9 equals $\frac{1}{8}$ of what?

7 equals $\frac{1}{8}$ of what?

12 equals $\frac{1}{8}$ of what?

6 equals $\frac{1}{8}$ of what?

4 equals $\frac{1}{8}$ of what?

5 equals $\frac{1}{8}$ of what?

10 equals $\frac{1}{8}$ of what?

LESSON IX.

1. $\frac{1}{8}$ of 24 hours? 16 weeks? 64 desks? \$160?

2. $\frac{1}{8}$ of \$48? \$72? 56 dimes? 40 bushels?

3. $\frac{1}{8}$ of 96 dozen? 80 boxes? 82 quarts? 88 cows?

4. There are 8 quarts in a peck. What part of a peck is 1 quart? 2 quarts? 3 quarts? 4 quarts? 5 quarts? 6 quarts? 7 quarts?

5. 1 quart is what part of a peck? 2 quarts? 3 quarts?
4 quarts? 5 quarts? 6 quarts? 7 quarts?

6. What is $\frac{1}{8}$ of 16 dollars? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

7. What is $\frac{1}{8}$ of 40 dimes? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

8. What is $\frac{1}{8}$ of 48 cents? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

9. What is $\frac{1}{8}$ of 32 quarts? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

10. What is $\frac{1}{8}$ of 56 quarts? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

11. What is $\frac{1}{8}$ of 72 yards? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

12. What is $\frac{1}{8}$ of 96 hats? $\frac{2}{8}?$ $\frac{3}{8}?$ $\frac{4}{8}?$ $\frac{5}{8}?$ $\frac{6}{8}?$ $\frac{7}{8}?$

13. How many 8's in 17? 18? 20? 28? 15? 19?

14. How many 8's in 25? 26? 28? 30? 38? 29?

15. How many 8's in 34? 44? 54? 65? 36? 63?

16. How many 8's in 86? 46? 58? 68? 35? 47?

17. How many 8's in 75? 82? 89? 95? 19? 91?

18. How many 8's in 160? 240? 400? 820? 720?

LESSON X.

1. At \$8 a month, how much can a boy earn in 6 months?

2. At 8 cents a quart, what do 8 quarts of strawberries cost?

3. A spider has 8 legs. How many legs have 4 spiders?

7 spiders?

4. There are 8 quarts in a peck. How many quarts in 2 pecks? 8 pecks? 5 pecks? 10 pecks? 12 pecks?
5. At \$8 a ton, what will 8 tons of coal cost? 4 tons? 6 tons? 8 tons?
6. Cost of a dozen slates at 8 cents each?
7. How many miles does a man walk in 9 days when he walks 8 miles daily?
8. A boy saves 8 cents a day by selling papers. How much money does he save in a week?
9. If 8 men do some work in 5 days, how many men can do the same work in 1 day?
10. If it requires 8 yards of calico to make a gown, how many yards will be required to make 7 such gowns?
11. How many yards of velvet can be bought for \$48 at \$8 a yard?
12. If 8 yards of velvet cost \$48, what is the cost of 1 yard?
13. At 8 cents a pound for sugar, how many pounds will 72 cents buy?
14. How many barrels of flour will \$96 purchase at \$8 per barrel?
15. In how many days can 8 men earn as much as 4 men in 6 days?
16. 48 cents were paid for coffee, and $\frac{1}{2}$ as much for sugar. How much was paid for both?
17. How many pecks in 16 quarts? 24 quarts? 32 quarts? 56 quarts?
18. A quantity of provision will last 1 man 80 days. How long will it last 8 men?
19. How long will it take a man to walk 72 miles if he walks 8 miles each hour?
20. For \$56 how many barrels of pork can be bought when \$8 are paid for 1 barrel?

LESSON XI.

9	45	81
18	54	90
27	63	99
36	72	108

a. How many 9's in 18? 27? 36? 45? 54? 63?
 72? 81? 90? 99? 108?

b. What is $\frac{1}{9}$ of 18? 27? 36? 45? 54? 63? 72?
 81? 90? 99? 108?

c. What part of 9 is 1? Of 18 is 2? Of 27 is 3?
 Of 36 is 4? Of 45 is 5? Of 54 is 6? Of 63 is 7?
 Of 72 is 8? Of 81 is 9? Of 90 is 10? Of 108 is 12?

d. 2 is $\frac{1}{9}$ of what? 3? 4? 5? 6? 7? 8? 9?
 10? 11? 12?

$\frac{1}{9}$ of 18 equals what?	5 equals $\frac{1}{9}$ of what?
$\frac{1}{9}$ of 81 equals what?	7 equals $\frac{1}{9}$ of what?
$\frac{1}{9}$ of 63 equals what?	9 equals $\frac{1}{9}$ of what?
$\frac{1}{9}$ of 36 equals what?	11 equals $\frac{1}{9}$ of what?
$\frac{1}{9}$ of 72 equals what?	8 equals $\frac{1}{9}$ of what?

$\frac{1}{9}$ of 9 miles? 18 rods? 27 feet? 86 inches?

$\frac{1}{9}$ of 45 days? 54 hours? 63 minutes? 99 seconds?

$\frac{1}{9}$ of \$72? \$.81? 90 horses? 108 sheep?

$\frac{1}{9}$ of 180 bushels? 270 barrels? 860 pounds?

LESSON XII.

1. 90 equals how many 9's? 11. 56 equals how many 8's?
 2. 45 equals how many 9's? 12. 68 equals how many 7's?
 3. 81 equals how many 9's? 13. 54 equals how many 6's?
 4. 99 equals how many 9's? 14. 72 equals how many 8's?
 5. 27 equals how many 9's? 15. 42 equals how many 7's?
 6. 18 equals how many 9's? 16. 72 equals how many 6's?
 7. 86 equals how many 9's? 17. 48 equals how many 6's?
 8. 54 equals how many 9's? 18. 48 equals how many 4's?
 9. 108 equals how many 9's? 19. 48 equals how many 8's?
 10. 63 equals how many 9's? 20. 84 equals how many 7's?

1. 20 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 2. 25 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 3. 38 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 4. 87 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 5. 41 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 6. 47 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 7. 52 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 8. 68 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 9. 72 are how many 9's? 8's? 7's? 6's? 5's? 4's?
 10. 90 are how many 9's? 8's? 7's? 6's? 5's? 4's?

1. If 9 yards of calico cost one dollar, what part of a dollar does 1 yard cost? 2 yards? 3 yards? 4 yards? 5 yards?
 6 yards? 7 yards? 8 yards?

2. If 9 yards of cloth cost \$18, what does 1 yard cost? 2 yards? 3 yards? 4 yards? 5 yards? 6 yards? 7 yards?
 8 yards?

3. What is $\frac{1}{9}$ of \$27? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? $\frac{5}{9}$? $\frac{6}{9}$? $\frac{7}{9}$? $\frac{8}{9}$?
 4. What is $\frac{1}{9}$ of 86 feet? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? $\frac{5}{9}$? $\frac{6}{9}$? $\frac{7}{9}$? $\frac{8}{9}$?
 5. What is $\frac{1}{9}$ of 45 cents? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? $\frac{5}{9}$? $\frac{6}{9}$? $\frac{7}{9}$? $\frac{8}{9}$?
 6. What is $\frac{1}{9}$ of 54? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? $\frac{5}{9}$? $\frac{6}{9}$? $\frac{7}{9}$? $\frac{8}{9}$?

LESSON XIII.

1. There are 9 square feet in 1 square yard. How many square feet in 2 square yards? 3 square yards?
2. What will 5 dozen eggs cost at 9 cents a dozen?
3. What will 6 barrels of flour cost at \$9 a barrel?
4. At 9 cents a yard, what will 7 yards of ribbon cost?
5. What will 8 slates cost at 9 cents each?
6. How far can a man walk in 9 hours, walking 9 miles an hour?
7. When coal costs \$9 a ton, what do 10 tons cost?
8. If 9 men can build a wall in 11 days, how long will it take one man to build it?
9. If 9 men can do $\frac{1}{2}$ of a piece of work in a day, how many men will be required to do the whole of it?
10. If 6 men can build a wall in 12 days, in how many days can 9 men build it?
11. If one man can dig a ditch in 18 days, in how many days can 9 men dig it?
12. If 9 pounds of sugar cost 54 cents, what is the price of a pound?
13. How many boxes of berries can be bought for 45 cents, at 9 cents a box?
14. At \$9 a barrel, how many barrels of flour will \$63 buy?
15. With 90 cents, how many pine-apples can be bought at 9 cents a piece?
16. 81 yards of calico will make 9 gowns. How many yards will make one gown?
17. \$108 will buy 9 sheep. Price of one sheep?
18. When the price of 9 sheep is given, how do you find the price of one sheep?
19. \$45 pays the rent of a house one month. The gas bill is $\frac{1}{9}$ of the rent. What is paid for rent and gas?
20. If a year's fuel cost a family \$99 and the water tax is ~~as much~~, how many dollars will be paid for fuel and water?

LESSON XIV.

10	50	90
20	60	100
30	70	110
40	80	120

a. How many 10's in 20? 30? 40? 50? 60? 70?
 80? 90? 100? 110? 120?

b. What is $\frac{1}{10}$ of 20? 30? 40? 50? 60? 70? 80?
 90? 100? 110? 120?

c. 2 is $\frac{1}{10}$ of what number? 3? 4? 5? 6? 7? 8?
 9? 10? 11? 12?

d. $\frac{1}{10}$ of 20 equals what? 80? 40? 60? 100? 120?

e. 5 is $\frac{1}{10}$ of what what number? 4? 6? 9? 12?

$\frac{1}{10}$ of 100 cents? 90 sheep? 70 hats? 80 pens?

$\frac{1}{10}$ of 20 dimes? 40 miles? 60 feet? 80 pins?

$\frac{1}{10}$ of 120 pencils? 50 boys? 110 girls? 150 cows?

- 1 cent is what part of a dime? 2 cents? 3 cents?
 4 cents? 5 cents? 6 cents? 7 cents? 8 cents? 9 cents?
- What part of 1 dollar is 1 dime? 2 dimes? 3 dimes?
 4 dimes? 5 dimes? 6 dimes? 8 dimes? 9 dimes?
- There are 10 cents in a dime. How many cents in
 5 dimes? 10 dimes? 8 dimes? 6 dimes?
- If you sleep 10 hours each night, how many hours do
 you sleep in a week?
- At 10 cents a dozen, what cost 12 dozen eggs?
- At 10 cents a pound, what will 11 pounds of maple sugar
 cost?
- At \$10 a head, what will 8 calves cost?

LESSON XV.

11	55	99
22	66	110
33	77	121
44	88	132

1. How many 11's in 22? 55? 99? 121? 182? 99?
2. What is $\frac{1}{11}$ of 44? 66? 88? 110? 77? 55? 121?
3. 2 is $\frac{1}{11}$ of what number? 3? 5? 7? 9? 11? 6?
4. $\frac{1}{11}$ of 99 sheep? 66 desks? 88 rods? \$121? \$88?
5. What is $\frac{1}{11}$ of 11 knives? $\frac{2}{11}$? $\frac{3}{11}$? $\frac{4}{11}$? $\frac{5}{11}$? $\frac{6}{11}$?
6. What is $\frac{1}{11}$ of \$121? $\frac{2}{11}$? $\frac{3}{11}$? $\frac{4}{11}$? $\frac{5}{11}$? $\frac{6}{11}$? $\frac{7}{11}$?

12	60	108
24	72	120
36	84	132
48	96	144

1. How many 12's in 24? 36? 48? 60? 72? 84?
96? 108? 120? 182? 144?
2. What is $\frac{1}{12}$ of 48? 84? 60? 120? 144? 96? 72?
3. 2 is $\frac{1}{12}$ of what number? 3? 4? 5? 6? 7? 8?
9? 10? 11?
4. $\frac{1}{12}$ of 12 inches? 36 feet? 48 rods? 60 miles?
5. $\frac{1}{12}$ of \$108? \$182? \$144? \$96? \$72? \$96?
6. 28 are how many 12's? 11's? 10's? 7's? 9's? 8's?
7. 97 are how many 12's? 11's? 10's? 9's? 6's? 7's?
8. 43 are how many 12's? 9's? 8's? 7's? 11's? 5's?
9. 56 are how many 12's? 9's? 7's? 6's? 10's? 11's?
10. 67 are how many 12's? 11's? 8's? 6's? 9's? 7's?

LESSON XVI.

1. 12 are how many 6's? 4's? 8's? 2's?
2. 14 are how many 7's? 2's?
3. 15 are how many 5's? 8's?
4. 16 are how many 8's? 4's? 2's?
5. 18 are how many 9's? 6's? 8's? 2's?
6. 20 are how many 10's? 5's? 4's? 2's?
7. 22 are how many 11's? 2's?
8. 24 are how many 12's? 6's? 4's? 8's? 2's?
9. 27 are how many 9's? 8's?
10. 28 are how many 7's? 4's?
11. 30 are how many 10's? 6's? 5's? 8's?
12. 32 are how many 8's? 4's?
13. 33 are how many 11's? 8's?
14. 35 are how many 7's? 5's?
15. 36 are how many 12's? 9's? 6's? 4's?
16. 40 are how many 10's? 8's? 5's? 4's?
17. 42 are how many 7's? 6's?
18. 44 are how many 11's? 4's?
19. 45 are how many 9's? 5's? 8's?
20. 48 are how many 12's? 8's? 6's? 4's?
21. 50 are how many 10's? 5's?
22. 54 are how many 9's? 6's?
23. 55 are how many 11's? 5's?
24. 56 are how many 8's? 7's?
25. 60 are how many 12's? 10's? 6's? 5's?
26. 63 are how many 9's? 7's?
27. 66 are how many 11's? 6's?
28. 70 are how many 10's? 7's?
29. 72 are how many 12's? 9's? 8's? 6's?
30. 77 are how many 11's? 7's?
31. 80 are how many 10's? 8's?
32. 84 are how many 12's? 7's?

LESSON XVII.

MEASURES OF LENGTH.

ONE INCH.

TWO INCHES.

THREE INCHES.

We measure lines to find their *length*. Lines are measured by means of other lines of *known* length. A *foot* is the name of a line of known length. The other lines of known length are the *mile*, the *rod*, the *yard*, and the *inch*.

A *Table* shows the relation of these lines to each other.

12 inches = 1 foot.	1 mile = 320 rods.	1 inch = $\frac{1}{12}$ of a foot.
3 feet = 1 yard.	1 rod = $16\frac{1}{2}$ feet.	1 foot = $\frac{1}{3}$ of a yard.
$5\frac{1}{2}$ yards = 1 rod.	1 rod = $5\frac{1}{2}$ yards.	1 yard = $\frac{2}{3}$ of a rod.
$16\frac{1}{2}$ feet = 1 rod.	1 yard = 3 feet.	1 rod = $5\frac{1}{2}$ of a mile.
320 rods = 1 mile.	1 foot = 12 inches.	

1. How long is your slate? Draw a line on the black-board as long. How wide? Draw. How long is your Reader? Draw. How long is a pane of glass in your school room? How wide? Draw lines 3 inches, 4 inches, 6 inches, 9 inches, 12 inches, 15 inches, 18 inches, 24 inches in length.

2. How long is your desk? How wide? How long is the teacher's table? How wide? How long is the teacher's platform? How wide? How long are the music lines in your room? What is the height of the windows? Of the door? Of your room?

LESSON XVIII.

1. How many inches in 2 feet? 8 feet? 4 feet? 5 feet? 6 feet? 7 feet? 8 feet? 9 feet? 10 feet? 11 feet? 12 feet?
2. How many feet in 4 yards? 6 yards? 9 yards? 11 yards? 20 yards?
3. How many feet in 36 inches? 60 inches? 48 inches? 72 inches? 96 inches?
4. 11 yards = how many rods?
5. What part of a mile is 160 rods? 80 rods? 40 rods?
6. How many inches are 2 feet 10 inches? 8 feet 6 inches? 4 feet 4 inches? 1 foot 11 inches?
7. How many rods in 2 miles?
8. How many feet in a mile?
9. How many inches in a yard? 2 yards?
10. How many inches in $\frac{1}{2}$ of a yard?
11. How many inches in $\frac{1}{4}$ of a yard?
12. How many inches in $\frac{1}{6}$ of a yard?
13. How many inches in $\frac{1}{8}$ of a yard?
14. One-eighth of a mile is sometimes called a *furlong*. How many furlongs make a mile?
15. How many rods in a furlong?
16. How many rods in $\frac{1}{2}$ of a furlong?
17. How many rods are $\frac{1}{2}$ plus $\frac{1}{5}$ of a furlong.
18. A line 6 feet long is sometimes called a *fathom*. It is used in measuring the depth of the ocean. What does "Full forty fathoms down" mean.
19. How many yards in a fathom?
20. How many feet in 5 yards 2 feet?
21. At $\$1\frac{1}{2}$ a foot what will 6 yards 2 feet of lead pipe cost?

LESSON XIX.

MEASURES OF WEIGHT.



Tea, coffee, sugar, flour and coal are measured by weight; coal by the ton; flour by the hundred-weight (cwt.), *i. e.*, one hundred pounds; tea and coffee by the pound (lb.); and spices by the ounce (oz.).

TABLE.

16 ounces (oz.) = 1 pound (lb.)

100 pounds = 1 hundred-weight (cwt.).

2000 pounds = 1 ton (T.).

T. = 20 cwt. = 2000 lbs. = 32000 oz.

1. How many ounces are there in 2 lb. ? 3 lb. ? 4 lb. ?
5 lb. ? 2 lb. 2 oz. ? 3 lb. 2 oz. ? 4 lb. 4 oz. ? 5 lb. 5 oz. ?
2. How many pounds in 5 cwt. ? 7 cwt. ? 9 cwt. ?
3. $\frac{1}{2}$ of a ton = how many pounds ?
4. 500 pounds is what part of a ton ?
5. 1 oz. is what part of a pound ? 2 oz. ? 8 oz. ? 4 oz. ?
5 oz. ?
6. How many boys, weighing 100 lbs. each, would weigh a ton ?
7. What weights would a grocer use in weighing 24 ounces of pepper ?
8. How many 4 oz. weights exactly balance the 1 lb. weight ?
9. How many 2 oz. weights make a pound ?
10. How many 1 lb. weights would balance four 8 oz. and four 4 oz. weights ?

LESSON XX.

MEASURES FOR GRAINS, SEEDS, ETC.



Corn, wheat, and potatoes are measured by the bushel. Peas and beans are sold by the peck, half peck, and quart.

TABLE.

2 pints (pt.)	= 1 quart (qt.).	1 bu = 4 pks.
8 quarts	= 1 peck (pk.).	1 pk = 8 qts.
4 pecks	= 1 bushel (bu.)	1 qt = 2 pts.
1 bu. = 4 pks. = 32 qts. = 64 pts.		

1. How many pints in 8 qts.? 12 qts.? 25 qts.? 50 qts.?
2. How many quarts in 5 pks.? 7 pks.? 9 pks.? 12 pks.?
3. How many pecks in 8 bu.? 9 bu.? 12 bu.? 28 bu.?
4. How many quarts in 20 pts.? 80 pts.? 40 pts.? 50 pts.? 60 pts.? 90 pts.?
5. How many pecks in 24 qts.? 48 qts.? 72 qts.? 96 qts.?
6. How many bu. in 8 half bushels? 48 pks.? 2 half bu. and 8 pks.? 5 half bu. and 2 pks.?
7. What part of a pk. is 1 qt.? 8 qts.? 5 qts.? 7 qts.?
8. What part of a bu. is 1 pk.? 2 pecks.? a half bu. and a pk.?
9. How many qts. in 1 half bu. and 8 pks.? 5 pks. and 3 qts.? 1 bu. and 1 pk.?
10. Cost of a pk. of potatoes at 60 cents a bu.?
11. Cost of a qt. of beans at 64 cents a peck?

LESSON XXI.

MEASURES FOR OIL AND MILK.



The measures used by the grocer in measuring vegetables and fruit are made of wood. For measuring oil and milk, tin measures are used. These tin measures are the gallon, half-gallon, quart and pint.

TABLE.

$$2 \text{ pints} = 1 \text{ quart.}$$

$$4 \text{ quarts} = 1 \text{ gallon (gal).}$$

$$1 \text{ gallon} = 4 \text{ quarts} = 8 \text{ pints.}$$

1. How many quarts can be drawn from a 10 gallon can of oil?
2. Cost of 6 quarts of oil at 4 cents a quart?
3. How many pints in 2 gallons and 3 quarts?
4. 8 quarts is what part of 2 gallons?
5. With milk at 24 cents a gallon, how many pint milk tickets can be bought for 48 cents?
6. With milk at 25 cents a gallon, how many quart tickets can be bought for \$1?
7. How does the grocer measure a quart of beans? A quart of oil?
8. 96 pints of beer are how many gallons? 96 pints of beans are how many half pecks?
9. How many pint cupfuls of water will fill a 10 gallon pail?
10. From a gallon can of oil, 8 pints were spilled. How many pints remained?

LESSON XXII.

U. S. MONEY.

Money is the measure of value. What is the book worth? It is worth One Dollar. \$1. measures the value of the book. The units of value are: *one dollar, one dime, one cent, one mill.*

TABLE.

10 mills = 1 cent.

10 cents = 1 dime.

10 dimes = 1 dollar.

\$1. = 10 dimes = 100 cents = 1000 mills.

In reading figures used to represent money values the dime unit is not used. 8 dimes is read 80 cents. 2 dimes and 5 cents is read 25 cents.

In writing dollars, cents and mills, the dollar sign (\$) and the period (.), called the decimal point, must always be used. The sign \$ is placed before or at the left of the number and the decimal point between dollars and cents, or at the left of cents.

For 5 dollars write \$5.

For 50 cents write \$.50.

For 5 cents write \$.05.

For 5 mills write \$.005.

For 250 cents write \$2.50.

Read:	\$ 6.85	\$800.08	\$.995
	\$ 31.095	\$ 9.09	\$ 9.999
	\$ 5.50	\$.25	\$.184
	\$210.10	\$.758	\$1000.10
	\$201.015	\$.005	\$2500.25
	\$ 20.20	\$.125	\$5000.

LESSON XXIII.

Write: Two dollars, twenty-three cents, five mills.

3 dollars, 8 cents, 8 mills.

One hundred eighteen dollars and twenty-five cents.

605 dollars and nine cents.

2 thousand dollars and 8 mills.

200 ninety dollars fourteen cents.

Twenty-five dollars and twenty-five cents.

Seventy-five cents.

Seven cents and 5 mills.

800 cents.

1. Add \$1.25	\$1.18	\$20.25	\$1,185
<u> </u> <u>\$.75</u>	<u> </u> <u>\$.68</u>	<u> </u> <u>\$20.75</u>	<u> </u> <u>\$8,715</u>

2. From \$20.50	\$40.25	\$10.75	\$16.
Take <u> </u> <u>\$19.60</u>	<u> </u> <u>\$10.50</u>	<u> </u> <u>\$ 5.80</u>	<u> </u> <u>\$ 8.50</u>

3. \$.09 × 9 =	\$.10 × 10 =
\$.90 × 9 =	\$.12 × 12 =
\$9. × 9 =	\$.20 × 10 =
\$9.09 × 9 =	\$1.50 × 10 =
\$2.75 × 8 =	\$1.60 × 5 =

4. $\frac{1}{6}$ of <u>\$54.54</u> ?	<u>\$18.24</u> ?	<u>\$42.48</u> ?
--------------------------------------	------------------	------------------

5. $\frac{1}{7}$ of <u>\$49.68</u> ?	<u>\$6.80</u> ?	<u>\$8.40</u> ?
--------------------------------------	-----------------	-----------------

6. What would 2 dozen Readers cost at \$.90 each?

7. What would 8 horses cost at \$125 each?

8. If 9 acres of land cost \$360, what would 8 acres cost?

9. If 8 cords of wood are worth \$32, what are 24 cords worth? 86 cords?

10. What will 45 pounds of beef cost if 8 pounds cost \$.96?

LESSON XXIV.

NOTATION AND NUMERATION.

In language, number is expressed by words, answering the question "How many?"

The snow-plow was drawn by eight horses. How many horses? *Eight.*

Expressions of quantity answer the question, "How much?"
As: A ton of coal; a barrel of sugar.

In arithmetic, number is represented by figures. There are ten characters or figures used.

The expressing and reading of numbers by means of these ten characters is called Notation and Numeration.

The figures: 1, 2, 8, 4, 5, 6, 7, 8, 9, represent something of number or quantity.

The tenth character 0, zero or naught (sometimes called a cipher), represents nothing of number or quantity.

In writing numbers, the nine figures are used to express ones, tens, hundreds, thousands, ten-thousands, hundred-thousands, millions, etc., as is shown in the following columns, arranged thus:

	Ones.	Tens.	H'ds.	Thous.	Ten-	Hundred-	
					Thousands.	Thousands.	Millions.
1.	10.	100.	1 000.	10 000.	100 000.	1 000 000.	
2.	20.	200.	2 000.	20 000.	200 000.	2 000 000.	
3.	40.	800.	8 000.	80 000.	800 000.	8 000 000.	
4.	40.	400.	4 000.	40 000.	400 000.	4 000 000.	
5.	50.	500.	5 000.	50 000.	500 000.	5 000 000.	
6.	60.	600.	6 000.	60 000.	600 000.	6 000 000.	
7.	70.	700.	7 000.	70 000.	700 000.	7 000 000.	
8.	80.	800.	8 000.	80 000.	800 000.	8 000 000.	
9.	90.	900.	9 000.	90 000.	900 000.	9 000 000.	

LESSON XXV.

11 (eleven) is 10 and 1. One ten and one.

13 (thirteen) is 10 and 3. One ten and three.

34 (thirty-four) is 30 and 4. Three tens and four.

58 (fifty-eight) is 50 and 8. Five tens and eight.

125 (one hundred, twenty-five) is 100, 20 and 5. One hundred, two tens, and five.

3456 (three thousand, four hundred, fifty-six), is 3000, 400, 50, and six.

Express the following in figures :

One hundred, two tens, and five.

Four hundreds, five tens.

Seven hundreds, five tens and six.

Eight hundreds, nine tens and one.

Three hundreds, nine tens and one.

Five hundreds, three tens and seven.

Nine hundreds, nine tens and nine.

Six hundreds, six tens and six.

Two hundreds, three tens and one.

Eleven hundreds, one ten and one.

Thirteen hundreds, three tens and three.

Two hundred.

Nine hundred.

Two hundred, forty.

Nine hundred, forty.

Eight hundred, five.

Six hundred, seventy.

Three hundred, fifty.

Five hundred, eighty.

Three hundred, forty.

Five hundred, twenty.

Five hundred, ninety.

Seven hundred, thirty.

One hundred, ten.

Six hundred, ten.

When three figures are written side by side, what does the one at the right represent? The one next to it? The one at *the left*?

LESSON XXVI.

Write in figures :

1. Eight thousand seven hundred three, four thousand forty-five, six thousand three hundred eight, forty-eight hundred.
2. Five thousand forty-eight, nineteen hundred ninety, seven thousand eighty-two, eight thousand fifty.
3. Seven thousand two hundred forty, nine thousand nine hundred nineteen, six thousand seven, eight thousand seven hundred seventy-six.
4. Seven thousand one hundred seven, six thousand eight hundred four, nine thousand one hundred ten, five thousand five hundred fifty.
5. Six thousand eighty-six, four thousand forty, one thousand ten, nine thousand ninety-nine.
6. Eight thousand eighty, seventeen hundred fifty-seven, eleven hundred one, seven thousand seven.

Read the following :

1. 100 000	9 400	469 846
250 118	90 009	868 569
19 019	900 090	211 011
468 910	654 480	404 404

2. In the number 884 578, what do the three figures at the right represent? *Ans.* Units, tens, hundreds.

3. What do the three figures at the left represent?

Ans. Units, tens, hundreds of thousands.

4. *A Period* is a group of three figures representing units, tens, hundreds, of any denomination.

5. How many periods in the number 500 000?

6. What is the denomination of the first or right hand period?

7. What is the name of the second period?

8. Read:	100 000 000.	40 060 018.
	120 240 800.	5 009 005.
	468 519 181.	15 015 015.
	116 116 116.	160 116 161.
	875 498 765.	1 001 001.

9. In the number 842 416 518, how many periods?

10. What is the denomination of the third period?

11. What do the figures of the left hand period represent?

LESSON XXVII.

ADDITION.

6, 4 and 10 are how many?

This is called a question in *Addition*. We put together, or add, 6, 4 and 10 to find their sum or amount.

The *sum* of 6, 4 and 10 is 20.

Find the sum of:

$$\begin{array}{r}
 1. \quad \begin{array}{cccccccccc} 6 & 6 & 6 & 6 & 6 & 6 & 6 & 6 & 6 & 4 \\ 6 & 6 & 6 & 6 & 6 & 6 & 5 & 4 & 5 & 4 \\ 6 & 6 & 6 & 6 & 6 & 6 & 6 & 6 & 4 & 8 \\ 6 & 6 & 6 & 6 & 6 & 5 & 4 & 5 & 8 & 5 \\ 6 & 6 & 6 & 6 & 6 & 4 & 6 & 6 & 2 & 6 \\ \hline 1 & 2 & 3 & 4 & 5 & 8 & 8 & 2 & 6 & 6 \end{array}
 \end{array}$$

$$\begin{array}{r}
 2. \quad \begin{array}{cccccccccc} 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 \\ 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 6 \\ 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 5 & 5 \\ 7 & 7 & 7 & 7 & 7 & 7 & 7 & 4 & 4 & 4 \\ 7 & 7 & 7 & 7 & 7 & 7 & 6 & 6 & 6 & 8 \\ 7 & 7 & 7 & 7 & 7 & 8 & 5 & 8 & 8 & 2 \\ \hline 1 & 2 & 3 & 4 & 5 & 6 & 4 & 2 & 4 & 7 \end{array}
 \end{array}$$

LESSON XXVIII.

Add the columns in this Lesson from the bottom up, from the top down, from right to left, from left to right.

$$\begin{array}{r}
 1. \quad 8 \\
 8 \quad 7 \quad 2 \\
 8 \quad 6 \quad 6 \\
 8 \quad 4 \\
 8 \quad 7 \quad 5 \quad 7 \\
 8 \quad 6 \quad 4 \quad 8 \\
 8 \quad 5 \quad 8 \quad 5 \\
 8 \quad 8 \\
 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 4 \quad 8 \quad 5
 \end{array}$$

$$\begin{array}{r}
 2. \quad 9 \quad 9 \quad 9 \quad 9 \quad 9 \quad 9 \quad 1 \quad 9 \quad 9 \quad 9 \\
 9 \quad 9 \quad 9 \quad 6 \quad 9 \quad 8 \quad 3 \quad 5 \quad 9 \quad 9 \\
 9 \quad 9 \quad 8 \quad 5 \quad 9 \quad 7 \quad 2 \quad 6 \quad 9 \quad 9 \\
 9 \quad 9 \quad 8 \quad 9 \quad 7 \quad 6 \quad 4 \quad 8 \quad 9 \quad 9 \\
 9 \quad 9 \\
 9 \quad 8 \quad 7 \quad 8 \quad 7 \quad 5 \quad 6 \quad 2 \quad 7 \quad 9 \\
 6 \quad 8 \quad 8 \quad 5 \quad 7 \quad 4 \quad 8 \quad 3 \quad 9 \quad 9 \\
 7 \quad 8 \quad 5 \quad 5 \quad 9 \quad 9 \quad 9 \quad 6 \quad 9 \quad 9 \\
 5 \quad 8 \quad 6 \quad 5 \quad 2 \quad 8 \quad 9 \quad 7 \quad 1 \quad 2
 \end{array}$$

$$\begin{array}{r}
 3. \quad 8 \quad 8 \quad 9 \quad 6 \quad 8 \quad 8 \quad 7 \quad 5 \quad 4 \quad 8 \\
 5 \quad 7 \quad 8 \quad 6 \quad 8 \quad 8 \quad 8 \quad 8 \quad 5 \quad 3 \\
 7 \quad 5 \quad 7 \quad 6 \quad 4 \quad 5 \quad 9 \quad 7 \quad 2 \quad 9 \\
 6 \quad 6 \quad 6 \quad 5 \quad 4 \quad 5 \quad 6 \quad 8 \quad 2 \quad 2 \\
 8 \quad 4 \quad 5 \quad 5 \quad 7 \quad 7 \quad 5 \quad 2 \quad 7 \quad 7 \\
 8 \quad 2 \quad 2 \quad 5 \quad 8 \quad 7 \quad 4 \quad 9 \quad 3 \quad 4 \\
 7 \quad 8 \quad 8 \quad 7 \quad 9 \quad 9 \quad 2 \quad 8 \quad 6 \quad 6 \\
 8 \quad 9 \quad 6 \quad 7 \quad 7 \quad 9 \quad 7 \quad 8 \quad 5 \quad 5 \\
 4 \quad 3 \quad 4 \quad 8 \quad 6 \quad 6 \quad 9 \quad 4 \quad 4 \quad 4 \\
 9 \quad 7 \quad 9 \quad 2 \quad 6 \quad 4 \quad 1 \quad 4 \quad 5
 \end{array}$$

LESSON XXIX.

Facts to be memorized.

How many are;

6 and 6?	6 and 10?	8	5	7	9	4
6 and 5?	6 and 9?	6	6	6	6	6
6 and 7?	6 and 8?					
7 and 7?	7 and 10?	5	4	6	9	8
7 and 6?	7 and 9?	7	7	7	7	7
7 and 8?	7 and 5?					
8 and 8?	8 and 6?	4	6	5	7	9
8 and 7?	8 and 5?	8	8	8	8	8
9 and 9?	9 and 7?	5	7	4	6	8
9 and 8?	9 and 6?	9	9	9	9	9

Suggestion:

$$6+7 = 6+4+3 = 10+3 = 13.$$

$$7+8 = 7+3+5 = 10+5 = 15.$$

$$8+9 = 8+2+7 = 10+7 = 17.$$

The grouping and adding of numbers by tens will help to secure accuracy and rapidity. Both accuracy and rapidity in adding must be secured to the child or the work of the teacher is a failure.

Find the sum:

$$\begin{array}{cccccccccccc} 3 & 9 & 19 & 29 & 49 & 59 & 79 & 99 & 89 & 69 & 89 \\ \hline 6 & 6 & 6 & 6 & 6 & 6 & 6 & 5 & 6 & 6 & 6 \end{array}$$

LESSON XXX.

1.	8	18	88	58	98	78	48	68	88	28
	7	7	7	7	7	7	7	7	7	7
—	—	—	—	—	—	—	—	—	—	—
2.	9	29	49	69	89	99	59	79	89	109
	7	7	7	7	7	7	7	7	7	7
—	—	—	—	—	—	—	—	—	—	—
3.	9	49	29	59	89	69	89	79	99	109
	8	8	8	8	8	8	8	8	8	8
—	—	—	—	—	—	—	—	—	—	—
4.	14	25	86	47	58	69	75	84	98	77
	6	6	6	6	6	6	6	6	6	6
—	—	—	—	—	—	—	—	—	—	—
5.	18	24	85	56	47	88	79	87	95	99
	7	7	7	7	7	7	7	7	7	7
—	—	—	—	—	—	—	—	—	—	—

1. What is the sum of \$208, \$176 and \$510?
2. What is the sum of 124 bu., 408 bu., and 271 bu.?
3. What is the sum of 785 tons, 948 tons, and 870 tons?
4. What is the sum of 267 rods, 565 rods, and 97 rods?
5. What is the sum of 342 feet, 706 feet, and 680 feet?

Arrange in columns and add:

6. \$11.36, \$26.07, \$9.16, \$32.76, and \$2.84.
7. \$42.06, \$10.80, \$4.82, \$.77, and \$.98.
8. \$870.21, \$2.49, \$8.07, and \$94.
9. \$32.50, \$126.08, \$9.40, \$15.74, and \$140.
10. \$807.09, \$50, \$6.84, \$100.10, and \$450.
11. \$76, \$400, \$5.12, \$17.04, \$.97, and \$1.82.

LESSON XXXI.

1. Add together 89, 67, 92, 43, 84, 51.
2. Add together 270, 489, 126, 46.
3. Add together 2368, 235, 496, 1736.
4. Add together 66, 476, 801, 4009, 82, 127.

Add:

5. 12845	6. 23456	7. 5	8. 92583
8275	72564	23	4620
4721	8785	936	973
871	23584	6543	25
51028	987	92840	9
61234	96	72104	17

9. 28504	10. 358	11. 56789	12. 128456
4368	9246	8587	258071
25	14976	296	589347
9	845	89	258923
86	29	7	720145
378	7	12345	896012

1. $124 + 445 + 308 + 568 + 678 + 244 + 458 + 27 + 9 + 27.$
2. $275 + 808 + 42 + 606 + 8 + 640 + 816 + 46 + 22 + 582.$
3. $675 + 342 + 460 + 465 + 25 + 378 + 4,232 + 3645 + 8.$
4. $2465 + 478 + 3 + 495 + 756 + 4386 + 760 + 28 + 717.$
5. $871 + 24 + 684 + 6543 + 845 + 78 + 96 + 1234.$
6. $868 + 868 + 796 + 677 + 908 + 809 + 117.$
7. $1051 + 2482 + 6384 + 5768 + 4648 + 3456.$
8. $5129 + 36428 + 420564 + 43476 + 590 + 864.$
9. $490 + 590 + 690 + 790 + 890 + 990 + 1090.$
10. $2500 + 3600 + 4700 + 5800 + 6900 + 8 + 8 + 8.$

LESSON XXXII.

SUGGESTION: In adding long columns of figures some *test* of accuracy is desirable. Make three additions thus:

$$\begin{array}{r}
 & 6 & 7 & 8 & 4 & 5 & 6 \\
 3 & 6 & & & & & \\
 5 & 5 & & & & & \\
 4 & 6 & & & & & \\
 3 & 9 & & & & & \\
 4 & 1 & & & & & \\
 4 & 7 & & & & & \\
 \hline
 4 & 2 & 0 & 0 & 3 & 5 & 7
 \end{array}
 \quad
 \begin{array}{r}
 4 & 8 & 6 & 6 & 4 & 5 \\
 8 & 7 & 9 & 5 & 8 & 6 \\
 6 & 8 & 5 & 4 & 9 & 7 \\
 7 & 8 & 9 & 9 & 8 & 7 \\
 1 & 9 & 4 & 5 & 3 & 8 \\
 4 & 8 & 5 & 6 & 4 & 8 \\
 \hline
 4 & 2 & 0 & 0 & 3 & 5 & 7
 \end{array}
 \quad
 \begin{array}{r}
 4 & 7 \\
 4 & 1 \\
 3 & 9 \\
 4 & 6 \\
 5 & 5 \\
 3 & 6 \\
 \hline
 4 & 2 & 0 & 0 & 3 & 5 & 7
 \end{array}$$

Begin at the top of the left hand column and add down. Place the sum of column to the left, as above.

Begin at the bottom of the right hand column and add up. Place the sum of each column to the right, as above.

Examples for practice.

1. 68015	2. 72408	3. 878588
46768	80808	850728
87985	87586	747816
85408	56828	568851
98586	88584	685820
74858	57826	788218
48816	78587	987800
<hr/>		
4. 9219	5. 17908	6. 729509
6980	92895	896895
7096	77589	921959
9859	75991	799297
8987	11809	879656
7899	99798	690099
7908	78080	986905
<hr/>		

LESSON XXXIII.

1. A farmer sold a cow for 22 dollars, a ton of hay for 11 dollars, and a calf for 7 dollars; what did he receive for all?
2. A traveler walked 30 miles one day, 26 miles the next, and 21 miles the next; how many miles did he travel in the three days?
3. One day Sarah wrote in her copy-book 18 lines, Maria 16, and Carrie 15; how many lines did they all write?
4. A man gave 60 dollars for a horse, 23 dollars for a saddle, and 9 dollars for a bridle; what was the cost of the whole?
5. A boy received 86 cents on his birthday, 84 cents on Christmas day, and 27 cents on New-Year's day; how many cents did he receive?
6. A man bought a piece of land for 56 dollars, and paid 25 dollars for fencing it; for how much must he sell it to gain 15 dollars?
7. In an orchard there were found 12 apples under one tree, 15 under another, 11 under another, and 9 under another; how many apples under the four trees?
8. A grocer bought some hams for 20 dollars, some oats for 19 dollars, some fowls for 16 dollars, and five barrels of apples for 10 dollars; what did he pay for all?
9. A miller shipped by railroad 28 barrels of flour at one time, 37 at another, and 40 at another; how many barrels did he ship?
10. If for paper you pay 45 cents, for envelopes 15 cents, stamps 12 cents, pens 8 cents; how many cents do you pay for your stationery?
11. A drover bought 26 sheep of one man, 30 of another, 37 of another, and 40 of another; how many sheep did he purchase?
12. Bought a horse for 75 dollars, and sold him so as to gain 25 dollars; how much did I receive for him?

LESSON XXXIV.

1. A lady went shopping, and bought a silk dress for 22 dollars, a muff for 16 dollars, a shawl for 14 dollars, and had 7 dollars left; how much money had she at first?
2. Peter bought a knife for 85 cents; he gave the knife and 12 cents for a sled, which he sold so as to gain 10 cents on the cost; how much did he receive for the sled?
3. In a certain orchard are 81 apple trees, 27 peach trees, and 19 pear trees; how many trees in the orchard?
4. A farmer raised 54 bushels of wheat, 66 bushels of oats, and 40 bushels of corn; how many bushels of grain did he raise?
5. If it be 62 feet from the ground to the belfry of a church, and 76 feet from the belfry to the top of the steeple, how high is the top of the steeple from the ground?
6. In March are 31 days, in April 30, in May 31; how many days in those three months?
7. If a farm contain 88 acres of cleared land and 25 acres of wood land, how many acres are in the whole farm?
8. The distance from Boston to Worcester is 44 miles, from Worcester to Warren 29 miles, and from Warren to Springfield 25 miles; how many miles from Boston to Springfield?
9. Batavia is 87 miles west from Rochester, and 31 miles east from Buffalo by railroad; what is the distance from Rochester to Buffalo?
10. A tailor bought three pieces of cloth, the first containing 29 yards, the second 26 yards, and the third 25 yards; how many yards did the three pieces contain?
11. A carriage-maker sold a carriage for 15 dollars, and a sleigh for 48 dollars; what did he receive for both?

LESSON XXXV.

1. A lady bought a carriage for \$275, a horse for \$216, and a harness for \$49; how much did she pay for all?
2. A grocer bought 3 hogsheads of sugar, containing 1467 lb., 1824 lb., and 1296 lb.; also two barrels containing 254 lb., and 237 lb.; how much did he buy?
3. Mr. Smith's house and lot cost him \$7290; for how much must he sell them to gain \$1896?
4. There are 576 sheep in one flock, 758 in another, and 598 in a third; how many in the three flocks?
5. In one school there are 298 boys and 319 girls, in another 786 boys and 739 girls, in a third 917 boys and 986 girls; how many boys in the three schools? How many pupils?
6. A merchant's sales were \$179 on Monday, \$215 on Tuesday, \$207 on Wednesday, \$173 on Thursday, \$198 on Friday, and \$289 on Saturday; what was the amount of his sales for the week?
7. In one town there are 7889 people, in another 12878, in a third 14796, in a fourth 10098, in a fifth 9886; how many people in the five towns?
8. A is worth \$7859, B is worth \$19868, C is worth \$9796, D is worth \$29560, E is worth \$19840; how much are they all worth?
9. A dealer sold six loads of coal, weighing 2978 lb., 3144 lb., 2706 lb., 2198 lb., 2896 lb., and 3273 lb.; how many pounds did the six loads weigh?
10. A man bought a lot of land for \$7960, built a house on it costing \$4719, added other improvements worth \$4090, and sold the whole at a gain of \$2750; how much did he get for the property?
11. A man born in 1819, died when he was 57 years old; in what year did he die?

LESSON XXXVI.

1. A man traveled 250 miles by railroad, 325 by steam-boat, and 190 by stage. How many miles did he travel?
2. Three persons deposited money in a bank. The first put in 192 dollars, the second 466 dollars, and the third 825 dollars. How much money did they deposit?
3. A man paid out \$5719 and had \$3956 left; how much had he at first?
4. The population of six towns is: 5860, 8748, 8087, 8746, 4875, 5390. Find the whole population.
5. A house-lot cost \$875. For building a house there was paid to carpenters, \$2487; to masons, \$680; to painters, \$389. What was the entire cost of house and lot?
6. A collector collected on Monday \$817.75; on Tuesday, \$947.50; on Wednesday, \$170.90; on Thursday, \$5687.48; on Friday, \$275.42. Saturday was a holiday. What did the week's collections amount to?
7. Bought a sleigh for \$175, a carriage for \$875, pair of horses for \$480, and a set of harness for \$150. Find entire cost.
8. Six loads of flour weighed as follows: 3560 pounds, 4980 pounds, 3760 pounds, 4,768 pounds, 3490 pounds, 4976 pounds. What was the weight of the six loads?
9. A man paid \$8090 for 656 horses, \$7880 for 842 horses, and \$9988 for 758 horses. How many horses did he buy and what did they cost him?
10. How many bricks are 6666 bricks, 7777 bricks, 8888 bricks, and 9999 bricks?

LESSON XXXVII.

SUBTRACTION.

1. If from a dish, containing 15 eggs, 7 eggs be taken, what number of eggs will remain in the dish?

This is a question of *Subtraction*.

You have learned that 7 and 8 are 15.

Therefore, 15 less 7 equals 8.

2. The operation of taking a part out of a whole to see what is left is *Subtraction*.

3. The whole number (15 eggs) is called the *Minuend*.

4. The part taken (7 eggs) is called the *Subtrahend*.

5. The part left or remaining (8 eggs) is called the *Difference* or *Remainder*.

6. The *Minuend* is the whole, of which the *Subtrahend* and *Difference* are the parts.

7. To find what number added to the *Subtrahend* will equal the *Minuend* is the problem of *Subtraction*.

8. *Minuend* = *subtrahend* + *difference*.

Minuend — *subtrahend* = *difference*.

Minuend — *difference* = *subtrahend*.

9. If out of the sum of \$25, \$17 be paid, how many dollars remain?

What is the *minuend*?

What is the *subtrahend*?

What is the whole out of which a part is taken?

10. $17 + ? = 25 \therefore 25 - 17 = ?$

What number added to 17 equals 25?

What number is 17 less than 25?

What is the difference between 25 and 17? Between 25 and 8?

LESSON XXXVIII.

1.

$$\begin{array}{llll}
 6+ ?=18 \therefore 18-6=? & 7+ ?=15 \therefore 15-7=? \\
 6+ ?=15 \therefore 15-6=? & 7+ ?=18 \therefore 18-7=? \\
 6+ ?=11 \therefore 11-6=? & 7+ ?=16 \therefore 16-7=? \\
 6+ ?=14 \therefore 14-6=? & 7+ ?=12 \therefore 12-7=? \\
 6+ ?=10 \therefore 10-6=? & 7+ ?=23 \therefore 23-7=?
 \end{array}$$

2.

$$\begin{array}{llll}
 8+ ?=18 \therefore 18-8=? & 9+ ?=18 \therefore 18-9=? \\
 8+ ?=17 \therefore 17-8=? & 9+ ?=16 \therefore 16-9=? \\
 8+ ?=16 \therefore 16-8=? & 9+ ?=21 \therefore 21-9=? \\
 8+ ?=14 \therefore 14-8=? & 9+ ?=17 \therefore 17-9=? \\
 8+ ?=15 \therefore 15-8=? & 9+ ?=15 \therefore 15-9=?
 \end{array}$$

5.

18 less 4?
18 less 7?
18 less 6?
18 less 9?
18 less 5?
18 less 8?

6.

14 less 5?
14 less 9?
14 less 6?
14 less 8?
14 less 7?
14 less 4?

7.

15 less 7?
15 less 9?
15 less 8?
15 less 6?
15 less two 5's?
15 less three 4's?

8.

16 less 7?
16 less 9?
16 less 5?
16 less 8?
16 less three 5's?
16 less four 3's?

9.

17 less 8?
17 less 9?
17 less 7?
17 less two 7's?
17 less four 4's?
17 less 5 + 6?

10.

18 less 18?
18 less 7?
18 less 9?
18 less 6?
18 less 8 + 7?
18 less five 3's?

LESSON XXXIX.

1. 21 less 9?	2. 88 less 19?	3. 42 less 5?
21 less 18?	88 less 17?	42 less 7?
21 less 17?	88 less 15?	42 less 9?
21 less 6?	88 less 9?	42 less 18?
21 less 8?	88 less 7?	42 less 15?
21 less 7?	88 less 5?	42 less 17?
4. 45 less 86?	26? 16?	5. 45 less 89? 29? 19?
45 less 88?	28? 18?	47 less 88? 28? 18?
45 less 84?	24? 14?	53 less 47? 87? 27?
45 less 37?	27? 17?	61 less 15? 16? 25?
45 less 89?	29? 19?	62 less 18? 14? 28?
45 less 33?	23? 13?	62 less 19? 18? 49?
6. 88 less 6?	16? 26? 86?	46? 56? 66? 76?
88 less 4?	14? 24? 84?	44? 54? 64? 74?
88 less 8?	18? 28? 88?	48? 58? 68? 78?
88 less 5?	15? 25? 85?	45? 55? 65? 75?
88 less 9?	19? 29? 89?	49? 59? 69? 79?
88 less 7?	17? 27? 87?	47? 57? 67? 77?
7. 72 less 8?	18? 23? 88?	48? 58? 68?
72 less 4?	14? 24? 84?	44? 54? 64?
72 less 5?	15? 25? 85?	45? 55? 65?
72 less 7?	17? 27? 87?	47? 57? 67?
72 less 8?	18? 28? 88?	48? 58? 68?
72 less 9?	19? 29? 89?	49? 59? 69?
8. 91 less 13?	43? 23? 88?	68? 88? 53? 73?
91 less 24?	14? 84?	4? 74? 44? 64?
91 less 15?	85? 75?	5? 85? 45? 65?
91 less 86?	16? 86?	6? 26? 76? 46?
91 less 17?	87? 27?	47? 87? 57? 77?
91 less 18?	8?	48? 78? 68? 88? 28? 58?

LESSON XL.

1. Find the difference between 82 and 45.

SUGGESTION:

$$\begin{array}{r} 82 - 70 + 12 \\ 45 - 40 + 5 \\ \hline 37 - 30 + 7 \end{array}$$

2. Find the difference between:

1. 63 and 24.	1. 60 and 41.	1. 81 and 49.
2. 75 and 19.	2. 70 and 22.	2. 63 and 27.
3. 84 and 27.	3. 80 and 13.	3. 57 and 18.
4. 92 and 35.	4. 90 and 54.	4. 74 and 35.
5. 57 and 28.	5. 98 and 29.	5. 93 and 56.
6. 47 and 64.	6. 19 and 66.	6. 82 and 47.
7. 29 and 63.	7. 23 and 71.	7. 67 and 39.
8. 88 and 97.	8. 34 and 82.	8. 76 and 28.
9. 26 and 85.	9. 41 and 90.	9. 63 and 44.
10. 17 and 42.	10. 18 and 96.	10. 95 and 38.

3. From 420 subtract 124.

$$\begin{array}{r} 420 - 300 + 110 + 10 \\ 134 - 100 + 30 + 4 \\ \hline 286 - 200 + 80 + 6 \end{array}$$

4. Find the difference between:

1. 612 and 178.	1. 462 and 238.	1. 531 and 353.
2. 523 and 164.	2. 374 and 257.	2. 642 and 265.
3. 825 and 187.	3. 281 and 265.	3. 763 and 278.
4. 417 and 158.	4. 592 and 288.	4. 824 and 297.
5. 781 and 194.	5. 476 and 268.	5. 915 and 526.
6. 324 and 165.	6. 852 and 239.	6. 812 and 355.
7. 942 and 174.	7. 407 and 284.	7. 514 and 136.
8. 635 and 189.	8. 308 and 275.	8. 972 and 479.
9. 522 and 156.	9. 609 and 258.	9. 624 and 248.
10. 417 and 168.	10. 205 and 81.	10. 512 and 247.
11. 825 and 186.	11. 506 and 268.	11. 718 and 364.
12. 712 and 194.	12. 807 and 442.	12. 817 and 528.

LESSON XLI.

1. From 4000 subtract 1204.

SUGGESTION:
$$\begin{array}{r} 4000 - 3000 + 900 + 90 + 10 \\ 1204 - 1000 + 200 + 0 + 4 \\ \hline 2796 - 2000 + 700 + 90 + 6 \end{array}$$

	2.	3.	4.
From	3278	6845	5702
Subtract	<u>1423</u>	<u>2462</u>	<u>4884</u>
	<u> </u>	<u> </u>	<u> </u>
	5.	7465	3270

	6.	7.	8.
From	42679 miles	51062 acres	2467 feet
Subtract	<u>14384</u> "	<u>24800</u> "	<u>1808</u> "
	<u> </u>	<u> </u>	<u> </u>

9. Subtract 20762 from 53120.

10. Subtract 6472 rods from 15200 rods.

1. From \$8 take \$2 and 68 cents.
2. From \$1 take 37 cents.
3. Subtract \$5 and 19 cents from \$28.
4. Out of \$8 take 87 cents.
5. \$3.04 less 95 cents equals what?
6. Out of 1 ton take 1120 lbs.
7. From 2 days take 25 hours.
8. From 1 yard measure off 1 ft. six inches. What remains?
9. From the month of June deduct $\frac{1}{7}$ of a week.
10. From 500 lbs. take 4 cwt.
11. From $\frac{1}{6}$ of \$420 take $\frac{1}{7}$ of \$420.
12. From $\frac{1}{8}$ of 720 pounds take $\frac{1}{9}$ of 720 pounds.
13. From \$12 take 12 cents.
14. From \$49 take \$.49.
15. From 15 yards take 15 feet.

LESSON XLII.

What is the difference between:

1.	Three	6's and two	7's?
2.	Three	7's and two	8's?
3.	Three	8's and two	9's?
4.	Three	9's and two	10's?
5.	Four	6's and three	7's?
6.	Four	7's and five	5's?
7.	Four	8's and six	5's?
8.	Four	9's and four	7's?
9.	Six	7's and four	8's?
10.	Six	8's and seven	6's?
11.	Six	9's and seven	7's?
12.	Seven	5's and four	7's?
13.	Seven	8's and nine	6's?
14.	Seven	9's and eight	7's?
15.	Nine	9's and eleven	7's?
16.	Six	8's and four	12's?
17.	Three	12's and four	9's?
18.	Three	6's and two	9's?
19.	Eleven	11's and ten	12's?
20.	Twelve	10's and nine	9's?

1. A man, having 25 dollars due him, received a ton of hay worth 11 dollars, and the remainder in money. How much money did he receive?

2. There are 45 trees in an orchard; 35 of them are apple trees and the remainder peach trees. How many are peach trees?

3. From a piece of broadcloth containing 27 yards, 15 yards were cut? How many yards remained?

4. A jeweler bought a watch for 60 dollars, and sold it again for 75 dollars? How much did he gain?

5. The number of pupils registered in a school is 87; 65 are present. How many are absent?

LESSON XLIII.

1. Charles has 48 cents, and buys a slate for 16 cents. How many cents has he left?
2. A farmer sold a cow for 22 dollars, that cost him 30 dollars. How much did he lose by the bargain?
3. A grocer bought a quantity of sugar for 39 dollars, and sold it for 50 dollars. How much did he gain?
4. In a school are 27 boys and 35 girls. How many more girls than boys?
5. A man died at the age of 77 years, having been married 49 years. What was his age when he married?
6. Martin having 27 marbles gave 12 to Albert and lost 5. How many had he left?
7. Reuben had 16 cents, Charles gave him 10, Elisha gave him 9, and Henry gave him enough to make his number 42. How many cents did Henry give him?
8. A merchant bought a hogshead of sugar for 50 dollars; he paid 6 dollars for freight and customs, and sold the whole for 75 dollars. How much did he gain?
9. A man bought a watch for 40 dollars, a chain for 15 dollars, and a key for 3 dollars, and he sold the whole for 50 dollars. How much did he lose by the bargain?
10. Sarah bought a comb for 12 cents, some ribbon for 16 cents, a thimble for 10 cents, and some thread for 6 cents. How much had she left of fifty cents after paying for these articles?
11. A drover bought 9 sheep of one man, 12 of another, and 15 of another; he afterwards sold 8 and butchered 5. How many had he left?
12. From a piece of calico containing 26 yards Jane bought a dress of 5 yards, and Josephine another of 10 yards. How many yards were left in the piece?

LESSON XLIV.

1. Four men bought a horse for 80 dollars, the first gave 25 dollars, the second 20 dollars, and the third 18 dollars. How much did the fourth give?

2. A boy had 12 marbles, another boy gave him 10 more, another 9, and another enough more to make his number 40. How many did the last boy give him?

3. A man traveled 22 miles one day, and 26 miles the second day, and on the third day he traveled 80 miles on his return. How many miles was he from the place from which he first started?

4. George sold two dozen eggs for 20 cents, one bushel of apples for 87 cents, and received a pair of skates worth 75 cents. How much did he owe for his skates?

5. A man owed his grocer 18 dollars, his tailor 20 dollars, and a merchant 25 dollars; he paid the grocer 10 dollars, the tailor 12 dollars, and the merchant 15 dollars. How much did he still owe them all?

6. Bought a horse for 90 dollars, a cutter for 40 dollars, and a harness for 20 dollars, and then sold the whole for 50 dollars more than the horse cost me. Did I gain or lose by the bargain, and how much?

7. A lady bought a new bonnet for 7 dollars, a dress for 12 dollars, a pair of shoes for 2 dollars, and a parasol for 8 dollars. She gave the merchant 8 ten dollar bills; how many dollars must be returned?

8. A tailor bought a piece of cloth containing 81 yards, from which he sold 13 yards to one man, and 11 yards to another. How many yards were left of the piece?

9. A farmer had 45 sheep in one lot, 37 in another, and 80 in another. From the first he sold 10, from the second 15, and from the third 11; how many had he at first, and how many had he left?

LESSON XLV.

1. The great fire in Chicago was in 1871. How many years since?
2. A man having \$2575.75, gave \$1250 for a house, and paid \$570.64 for repairs. How much had he left?
3. Two men bought a piece of property for \$358.50. One paid \$146.80. How much did the other pay?
4. A farmer raised 2584 bu. of wheat. He sold 800 bu. to one man, and 1075 bu. to another. How many bushels had he left?
5. If a man's income is \$175 a month, and he pays \$25 for rent, \$44 for provisions, and \$18 for other expenses, how much will he have left?
6. George Washington was born in the year 1732, and died in 1799. At what age did he die?
7. Queen Victoria was born in 1819. How old is she? She became Queen of England in 1837. How long has she been a queen?
8. What number must be added to 4367 to make 7210?
9. The first newspaper published in America was issued at Boston in 1704. How many years since?
10. The Brooklyn Suspension Bridge was commenced in 1869, and finished in 1883. How long was it in building?
11. Bought a sack of flour for \$1.75, a pound of tea for \$.90, and some sugar for \$2.25. How much must I receive in change for a five-dollar bill?
12. A drover bought 8245 sheep, and sold 1200 of them. How many had he left?
13. A speculator gained \$5760, and afterward lost \$2746; at another time he gained \$3575, and then lost \$4682. How much did his gains exceed his losses?
14. A flour merchant bought 240 barrels of flour for \$1920, and sold the same at \$10 a barrel. What did he gain?

LESSON XLVI.

1. A lot that cost \$475 was sold for \$725. What was the gain?
2. A horse that cost \$315 was sold for \$268. What was the loss?
3. If I give \$141 for a piece of cloth containing 47 yards, for how much must I sell it in order to gain one dollar a yard?
4. A speculator who owned 500 acres, 17 acres, 98 acres, and 121 acres of land, sold 235 acres. How many acres had he left?
5. A dealer sold a cargo of salt for \$2800 and gained \$625. What did the cargo cost him?
6. The art of printing was invented in 1441. How many years ago was it?
7. The telescope was invented in 1610. How many years since that time?
8. Benj. Franklin died at the age of 84 in 1798. In what year was he born?
9. America was discovered in 1492. How many years ago?
10. American Independence dates from July 4, 1776. How many anniversaries have there been?
11. Sir Isaac Newton was born in 1642, and died in 1727. What was his age?
12. How old are you? From your age find in what year you were born?
13. It is now Tuesday noon. How long is it since 9 o'clock A. M. of yesterday?
14. How old is a man in 1885 who was born in 1837?
15. In what year was a man born who is now 92 years of age?
16. Figures were used by the Arabs in the year 890. How long ago?
17. Decimal fractions were invented in 1464. How long since?

LESSON XLVII.

1. From 6438 subtract the sum of 2804, 983, 46 and 8.

SUGGESTION:

Minuend, 6438 Write the numbers as in addition.
 2304 Connect the numbers of the subtra-
 Subtrahend, { 983 hend by a brace. Add the columns
 46 of the subtrahend thus: 8, 14, 17,
 8 21, and 7 are 28. Write 7 in the
 Difference, 3097 difference.) 2, 6, 14, and 9 are
 23. (Write 9 in the difference.) 2,
 11, 14. (Write zero in the difference.) 1, 3, and 3 are 6. (Write
 3 in the difference.)

	2.	3.	4.	5.	6.
Min.	7862	18344	29460	44444 lbs.	\$764.90
Sub.	{ 1646	{ 6462	{ 17940	{ 2222 lbs.	{ \$250.40
	876	4366	3460	8888 lbs.	164.50
	49	868	580	5555 lbs.	75.19

Diff.

7. The sum of three numbers is 90090. Two of them are 50050 and 6606. What is the third number?

8. A man left \$50000 to his wife, two sons, and daughter. To his wife, \$20000; to each of his sons, \$12500. What was the daughter's portion?

9. A man owed \$12500 on his house. After making three 3000 dollar payments and one payment of \$2650, how much did he owe?

10. A suburban gentleman bought a 1000-mile railroad ticket for family use. His wife rode 140 miles, his son 124 miles, his daughter 168 miles and the gentleman himself the remainder. How many miles did the gentleman ride?

11. A man bought four city lots, for which he paid \$15760. For the first he paid \$2175, for the second \$8794, and for the third \$4587. How much did he pay for the fourth?

LESSON XLVIII.

1. Paid \$979 for a lot and \$7580 for the house on it. How much more did the house cost than the lot?
2. A gentleman's income is \$7560 a year. How much may he save if his expenses are \$3928?
3. A man bought a farm for \$12500, and sold it at a loss of \$3856. What was the selling price?
4. A man has property worth \$31567, and owes \$19708. How much will he have after paying his debts?
5. A merchant had deposited in bank \$9723. How much had he left in bank after drawing out enough to pay a bill of \$2757?
6. A has property worth \$17250, which is \$3980 more than the value of B's property. What is the value of B's property?
7. A gardener received one year for the fruits and vegetables he raised \$4125, and his expenses were \$2739. How much were his profits?
8. A man who has \$7580, lacks how much of having enough to buy a farm worth \$10000?
9. What amount taken from \$21819 will leave \$17963?
10. What amount must be added to \$9562 to make \$10000.
1. 6846 — 4908.
2. 3000 — 1018.
3. 844 — 266.
4. 5641 — 2678.
5. 800 — 161.
6. 6005 — 27.
7. 4281 — 868.
8. 2872 — 1466.
9. 8000 — 111.
10. From \$1 take 1 cent.
11. From \$2 take 18 cents.
12. From \$3 take \$1.12.
13. From \$4 take \$2.07.
14. From \$5 take \$2.10.
15. From \$6 take \$4.90.
16. From \$7 take \$3.09.
17. From \$8 take \$4.40.
18. From \$9 take \$6.27.

LESSON XLIX.

MULTIPLICATION.

1. How many trees are there in 8 rows of 9 trees each?
This is a question of ***Multiplication***.

ANALYSIS. In 8 rows there are 8 times as many trees as in 1 row. There are, therefore, 8 times 9 trees, or a number of trees equal to eight 9's. You have learned that eight 9's are 72. And 8 times 9 trees are 72 trees.

2. In the example, 9 (the number of trees in each row) is the ***Multiplicand***.

3. 8 (the number of rows) is the ***Multiplier***.

4. 72 (the number of trees in 8 rows) is the ***Product***.

SUGGESTION: The product, like the multiplicand, is a number of trees.

5. The operation of combining numbers to obtain their product is ***Multiplication***.

6. The multiplicand and multiplier are sometimes called ***Factors*** of the product. Thus: 3 and 5 are factors of 15; 3 and 17 are factors of 51; 8, 4 and 5 are factors of 60.

7. What will 6 horses cost at \$125 each?

What is the multiplicand? \$125.

What is the multiplier? 6 ones.

What is the product? A number of dollars equal to six 125's.

8. $21 = \begin{cases} \text{three 7's} \\ \text{seven 3's} \end{cases}$ What are the factors of 21?

9. $45 = \begin{cases} \text{five 9's} \\ \text{nine 5's} \end{cases}$ What are the factors of 45?

10. $63 = \begin{cases} \text{seven 9's} \\ \text{nine 7's} \end{cases}$ What are the factors of 63?

LESSON L.

Find products

	30 mi. 1. <u>6</u>	40 mi. 2. <u>6</u>	60 mi. 3. <u>6</u>	80 mi. 4. <u>6</u>
2.	40 T. <u>7</u>	60 T. <u>7</u>	80 T. <u>7</u>	50 T. <u>7</u>
3.	\$50 <u>8</u>	\$80 <u>8</u>	\$60 <u>8</u>	\$90 <u>8</u>
4.	60 bu. <u>9</u>	70 bu. <u>9</u>	50 bu. <u>9</u>	90 bu. <u>9</u>
5.	25 <u>6</u>	86 <u>6</u>	47 <u>6</u>	58 <u>6</u>
6.	44 <u>7</u>	64 <u>7</u>	74 <u>7</u>	84 <u>7</u>
7.	56 <u>8</u>	66 <u>8</u>	76 <u>8</u>	86 <u>8</u>
8.	68 <u>9</u>	48 <u>9</u>	78 <u>9</u>	88 <u>9</u>
9.	48 <u>11</u>	77 <u>11</u>	73 <u>11</u>	56 <u>12</u>
10.	99 <u>6</u>	88 <u>7</u>	66 <u>9</u>	55 <u>11</u>
				90 <u>12</u>

LESSON LI.

1. What is the cost of 4 lots at \$250 each?

SOLUTION:

By addition:

$$\begin{array}{r}
 \$250 \\
 250 \\
 250 \\
 250 \\
 \hline
 \text{Sum. } \$1000
 \end{array}
 \quad \begin{array}{l}
 \text{The cost of the 4 lots is the sum of } \$250, \\
 \text{written as many times as there are lots, as shown} \\
 \text{in the margin.}
 \end{array}$$

By multiplication:

The same result is obtained by writing \$250 once and multiplying by 4. The operation may be recited thus: 4 50's are 200; 4 200's are Product. $\underline{\$1000}$ 800. $800+200=1000$.

It will be seen that the product is obtained with fewer figures than the sum.

Multiplication is a short way of obtaining results in addition by means of *memorized facts* of addition.

Without a previous knowledge of addition, no multiplication is possible.

	828	444	555	666	845	.
2.	6	6	6	6	6	.
	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
	444	555	616	456	634	
3.	7	7	7	7	7	
	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
	558	680	790	912	888	
4.	8	8	8	8	8	
	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
	543	654	765	876	987	
5.	9	9	9	9	9	
	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	

LESSON LII.

Find products:

1. \$ 4.80	\$ 42.10	\$ 18.40	\$ 11.44
6	7	8	9
—	—	—	—
2. 16 rds. 2 ft.	19 rds. 5 yds.	25 mi. 10 rds.	6 ft. 6 in.
6	7	8	9
—	—	—	—
3. \$ 81.92	\$ 21.70	\$ 15.15	\$ 18.19
6	7	8	9
—	—	—	—
4. 40 yrs. 50 ds.	7 wks. 7 ds.	25 h. 5 min.	9 min. 6 sec.
6	7	8	9
—	—	—	—
5. \$ 74.06	\$ 88.09	\$ 57.64	\$ 82.58
6	7	8	9
—	—	—	—
6. \$100.50	\$200.50	\$500.25	\$1000.75
6	7	8	9
—	—	—	—
7. 8708	7608	9107	4808
6	7	8	9
—	—	—	—
8. \$ 9.06	\$ 8.09	\$ 7.05	\$ 6.08
6	7	8	9
—	—	—	—
9. \$ 2.20	\$ 3.80	\$ 4.40	\$ 5.50
11	11	11	11
—	—	—	—
10. \$ 1.20	\$ 6.06	\$ 8.08	\$ 9.09
12	12	12	12
—	—	—	—
11. 440 min.	640 min.	320 rds.	365 min.
12	11	12	11
—	—	—	—
12. \$ 60.60	\$500.05	\$606.60	\$ 50.50
9	12	9	12
—	—	—	—

LESSON LIII.

1. At 6 cents a pound, what cost 675 pounds of rice?
2. At \$5.87 a yard, what is the cost of 7 yards of cloth?
3. At \$124.50 an acre, what will 5 acres of land cost?
4. What is the cost of 8 building lots, at \$2015 each?
5. What cost 326 tons of coal at \$6 a ton?
6. What cost 1288 cords of wood at \$5 a cord?
7. What cost 752 pounds of nails, at 7 cents a pound?
8. What cost 2140 barrels of flour at \$8 a barrel?
9. What cost 379 pounds of nails at 6 cents a pound?
10. At 9 cents a pound, what will 1872 pounds of sugar cost?
11. At \$98 a month how much can a man earn in 8 months.
12. At \$6.75 what will 7 tons of coal cost?
13. What are 514 barrels of apples worth at \$4 a barrel? At \$5? At \$7?
14. What cost 3250 pounds of pork at 6 cents a pound? At 8 cents? At 9 cents?
15. In one day there are 1440 minutes. How many minutes in 9 days?
16. 1 mile=5280 feet. How many feet in 8 miles?
17. 1 year=8760 hours. How many hours in 6 years?
18. 1760 yards=1 mile. How many yards in 7 miles?
19. If an army consumes 5763 barrels of flour a week, how many barrels will last the army 8 weeks?
20. If the profits of a mill are \$8750 a year, what will be the profits for five years?
21. What would 118 plows cost at \$11 each?
22. How many inches are there in 460 feet?
23. How many pecks are there in 1280 bushels?
24. How many pounds are there in 15 tons?
25. At 75 cents a pound, what is the cost of 9 lbs. of tea?

LESSON LIV.

1. At \$6 a ton for coal, what will 10 tons cost? 100 tons? 1000 tons?

SUGGESTION:

When the product can be written at sight, the form of an equation should be used in multiplication, instead of the usual form of writing the multiplier under the multiplicand. Observe that, in the product by 10, the figure of the multiplicand is written one place to the left; by 100, two places; by 1000, three places.

2. At \$5 per barrel, what is the cost of 100 barrels of apples?
 3. At \$16.80 a ton, what sum of money will purchase 1000 tons of hay?
 4. At \$215 a share, what do 100 shares of city railway stock cost?
 5. Multiply \$25.50 by 10, 100, 800, and add the products.
 6. How many cents are there in \$60?
 7. How many pounds are there in 20 hundred weight?
 8. How many days have there been in the months of January for the last 100 years?
 9. Multiply 5 cents by 10, 100, and 1000, and add the products.
 10. At \$50 a head what cost 100 head of cattle?

1. What is a farm of 500 acres worth at \$300 an acre?
 $\$300 \times 500 = \150000 .

SUGGESTION: $300 - 3 \times 100$
 $500 - 5 \times 100$
 \hline
 $150000 - 15 \times 10000$

2. Multiply 1200 by 60.
 3. Multiply 900 by 80.
 4. Multiply \$1200 by 120.
 5. Multiply 90 pounds by 110.
 6. Multiply \$18.185 by 2000.

LESSON LV.

1. Multiply 476 by 48.

476

48

1428=product by 3.1904 =product by 40.20468=product by 48.

SUGGESTION:

40— 4×10 .43— $40 + 3$.

We multiply by 43 by multiplying first by 3 and then by 4 and adding the two products. But because the 4 is 4 tens or 4×10 we write the second product one place to the left of the first product, since to multiply by 10 is to remove the figures so multiplied one place to the left.

2. Multiply 4782 by 36.
3. Multiply 8721 by 47.
4. Multiply 7648 by 54.
5. Multiply 3472 by 48.
6. Multiply 14761 by 83.
7. Multiply 5684 by 96.
8. Multiply \$2460 by 76.
9. Multiply \$2850 by 69.
10. Multiply \$826 by 75.
11. At \$156 each, what is the value of 84 wagons?
12. What cost 297 tons of iron at \$27 per ton?
13. A miller filled 898 sacks with flour, putting 49 pounds in each. How many pounds were required?
14. A canal 38 miles long cost \$2476 per mile. What was the whole cost?
15. How many yards in 76 pieces of muslin, each containing 39 yards?
16. A barrel of flour contains 196 pounds. How many pounds in 98 barrels?
17. Mr. Jones paid \$68 per acre for his farm of 885 acres. What did the farm cost?
18. There are 820 rods in a mile. How many rods in 27 miles?
19. How many pounds in 87 bales of cotton, each weighing 497 pounds?
20. How many days in 65 years of 365 days each?

LESSON LVI.

1. Multiply 458 by 15; by 51.

$$458 \times 15.$$

2290 = product by 5.

6870 = product by 15.

SUGGESTION:

$$15 - 10 + 5.$$

$$51 - 50 + 1.$$

$$458 \times 51.$$

2290 = product by 50.

23858 = product by 51.

Inspect operation in the margin for explanation.

2. Multiply 4865 by 18; by 17; by 19.

3. Multiply 5780 by 81; by 71; by 91.

4. How many days in 18 years of 365 days each?

5. How many lbs. in 61 bbls. of flour, each bbl. containing 196 lbs.

6. Multiply 456 by 374; by 608.

$$\begin{array}{r} 456 \\ \times 374 \\ \hline \end{array}$$

$$\begin{array}{r} 874 \\ \times 374 \\ \hline \end{array}$$

1824 = product by 4.

3192 = product by 70.

1368 = product by 300.

170544 = product by 374.

SUGGESTION:

$$374 = 300 + 70 + 4.$$

We multiply 456 by 4, 7 and 3.

In writing the product by 7 multiply by 10.

In writing the product by 3 multiply by 100.

$$\begin{array}{r} 456 \\ \times 608 \\ \hline \end{array}$$

$$\begin{array}{r} 608 \\ \times 608 \\ \hline \end{array}$$

3648 = product by 8.

2736 = product by 600.

277248 = product by 608.

SUGGESTION:

Inspect the operation in the margin.

Explain the placing of the product by 6.

LESSON LVII.

1. 408×825	11. 5800×643	21. 8481×820
2. 908×625	12. 7059×297	22. 4308×398
3. 794×793	13. 9000×580	23. 2909×756
4. 896×528	14. 11415×584	24. 5941×400
5. 1407×412	15. 3623×379	25. 2597×680
6. 2316×700	16. 5856×298	26. 6271×809
7. 7548×256	17. 7958×568	27. 7089×297
8. 9127×700	18. 3758×460	28. 8781×397
9. 7658×850	19. 8080×597	29. 5870×563
10. 5397×809	20. 9086×790	30. 9205×643

1. How many days in 129 years, counting 365 days as 1 year?
2. There are 144 square inches in a square foot; how many square inches in 576 square feet?
3. How many pages in 438 books, if there are 364 pages in each?
4. There are 160 square rods in an acre; how many square rods in a farm of 267 acres?
5. A steamer had a cargo of 516 bales of cotton, the average weight of each bale being 438 pounds; what was the entire weight of the cargo?
6. There are 2000 pounds in a ton; how many pounds in 234 tons?
7. There are 1760 yards in a mile. How many yards in 416 miles?
8. A factory makes 1750 boxes of matches a day. How many will it make in a year of 312 days?
9. The multiplicand is \$756, the multiplier is 418. What is the product?
10. A man bought 45 acres of land at \$38 an acre, and 76 acres at \$47 an acre, and sold the whole at \$45 an acre. Did he gain or lose, and how much?
11. A farmer exchanged 584 bushels of wheat at \$2 a bushel, for 78 barrels of flour at \$9 a barrel, and received the balance in money. How much money did he receive?

LESSON LVIII.

1. How many pounds of coal in 100 tons?
2. Cost of 500 barrels of flour at \$5.50 per barrel?
3. Cost of 7 thousand feet of lumber at 18 cents a foot?
4. How many feet are there in 500 miles?
5. A man will travel how many miles in 74 days, at the rate of 87 miles a day?
6. What was the cost of a drove of 257 head of cattle, if the average price was \$36 per head?
7. 1760 yards make a mile, 86 inches make a yard. How many inches in a mile?
8. If pork is worth \$27 per bbl., how much will 886 bbls. cost?
9. Sold 267 tons of hay at \$19 per ton. What was the amount of the sale?
10. Two persons start from the same point and travel in opposite directions; one travels at the rate of 82 miles a day, the other at the rate of 39 miles a day. How far apart will they be in 14 days?
11. A man bought two farms; one of 157 acres at \$26 an acre, and another of 138 acres at \$34 an acre. He paid at one time \$4725, and at another \$1895. How much remained unpaid?

Multiply

12. 2464 ft. by 808.	21. 625×625 .
13. 2240 lbs. by 506.	22. 128×128 .
14. 1728 in. by 144.	23. 640×640 .
15. 5880 ft. by 800.	24. 144×144 .
16. 4080 days by 1440.	25. 111×111 .
17. \$108.60 by 640.	26. 121×121 .
18. \$270.75 by 709.	27. 221×221 .
19. 7628 bbls. by 196.	28. 909×909 .
20. 5760 lbs. by 112.	29. 815×815 .

LESSON LIX.

1. A farmer owned 5 farms of 160 acres each. How much land did he own?

2. He set apart 36 acres from each farm for the raising of wheat. His wheat-yield averaged 18 bushels to the acre. How much wheat did he raise?

3. He sold his wheat for 92 cents a bushel. What did he receive for his wheat?

4. He planted 45 acres of each farm with corn, which yielded 32 bushels to the acre. How much corn did he raise?

5. He sold his corn for 48 cents a bushel. What did his corn come to?

6. If, instead of selling his corn, he had fed it to hogs and had sold his hogs for \$4500, how much better off would he have been?

7. Other portions of his land produced hay and oats, which he fed to horses, cattle and sheep. He sold 3 horses for \$175 each, 20 steers for \$60 each. He made 1200 pounds of butter which he sold at 23 cents a pound. He sheared 2400 pounds of wool which he sold for 81 cents a pound. What was his entire income from his 5 farms?

8. If his first farm cost him \$58 an acre; his second, \$65; his third, \$76; his fourth, \$87; his fifth \$118, what did his land cost him?

9. If he sell it at \$18 an acre more than it cost him, what will he receive for his land?

10. If the farmer, with a harvester, could do the work of 5 men during wheat harvest, what would the harvester be worth to him during a harvest of 20 days when labor is worth \$2.50 a day?

11. A merchant bought 29 pieces of cloth, each piece containing 47 yards, at \$8 a yard. Find cost.

12. What cost 45 sets of cyclopædias, each set containing 16 volumes, at \$7 a volume?

13. How many yards of sheeting in 57 bales, each bale containing 26 pieces, and each piece 44 yards?

LESSON LX.

1. How many minutes in April, June and November?
2. How many minutes in the summer months?
3. Cost of 8 miles of telegraph wire at 8 cents a foot?
4. In 8 tons of cheese how many pounds?
5. How many quarts do a bushel, a half bushel and a peck measure contain?
6. Bought 45 yards of cloth and sold 69 feet of it. How many yards remained? How many feet?
7. What is the difference between 8 pecks and 7 quarts?
8. How many times can a peck measure be filled from a two-bushel and a half-bushel measure?
9. How many pounds in $\frac{1}{4}$ of a ton?
10. How many quarts in $\frac{1}{4}$ of a bushel?
11. How many inches in $\frac{1}{8}$ of a yard?
12. How many minutes in $\frac{1}{6}$ of a day?
13. How many rods in $\frac{1}{8}$ of a mile?
14. How many pints in 8 pecks and 2 quarts?
15. What will 2 pecks of plums cost at 20 cents a quart?
16. At 5 cents a pint what is a bushel of chestnuts worth?
17. From a barrel containing 42 gallons, 10 gallons and 2 quarts were drawn. How many quarts remained?
18. How many half-pint glasses can your mother fill from 6 quarts of jelly?
19. Change 2 yards 2 feet to inches.
20. Change 8 bushels 3 pecks to quarts.
21. At 4 cents a pint for milk, what is the price per gallon?
22. At \$9 a yard for silk, what will $\frac{1}{3}$ of a yard cost?
23. Cost of $10\frac{1}{2}$ lbs. of sugar at 6 cents a pound?
24. Cost of $9\frac{1}{8}$ lbs. of butter at 12 cents a pound?
25. What will $\frac{1}{11}$ of 22 yards of carpet cost at \$1 a yard?
26. If 10 lbs. of butter cost \$2.50, what does $\frac{1}{5}$ of a lb. cost?

LESSON LXI.

DIVISION.

1. At \$7 a ton, how many tons of coal can be bought for \$63?

2. If \$63 are paid for 9 tons of coal, what is the price of one ton?

These are questions of *division*, since the number 63 is to be divided or separated into parts.

In the first example the question is, how many 7's in 63, or how many times is 7 contained in 63.

In the second, the question is, what is one of the nine equal parts of 63.

3. The operation of finding how many times one number is contained in another of the same kind, or of finding one of the equal parts of a number is ***Division***.

4. The number divided is called ***Dividend***.

5. The number by which we divide is called ***Divisor***.

6. The result obtained by dividing dividend by divisor is called ***Quotient***.

7. Any part of a dividend that cannot be divided is called ***Remainder***.

8. The divisor and quotient are factors of the dividend.

SUGGESTION TO THE TEACHER: Let every dividend be conceived of as having had a previous existence as a product. Referring again to the examples given, the dividend \$63 was obtained as a product. The divisor (\$7), in the first example, was the multiplicand. The divisor (9), in the second, was the multiplier.

Inference: When the dividend and divisor are alike, the product and multiplicand are given to find multiplier, and the language is, *how many times*. When the dividend and divisor are unlike, the product and multiplier are given to find multiplicand, and the language is, *what is one of the equal parts*.

LESSON LXII.

1. How many barrels, each holding 3 bushels, will be required for 18 bushels of apples? 21 bushels?
2. How many times can 6 yards of cloth be measured from a piece containing 30 yards?
3. How many times can 6 cents be taken from 23 cents so as to have 5 cents remaining?
4. Distribute \$28 equally among 7 men. How many dollars will each receive?
5. How do you find one of 8 equal parts of a number? Of 9 equal parts? Of 6 equal parts?
6. What is one of 4 equal parts of 40? Of 36? Of 48?
7. What is one of 6 equal parts of 30? Of 42? of 48?
8. What is one of 7 equal parts of 56 pounds?
9. How many times 8 cents are 48 cents?
10. What is one of 8 equal parts of 48 cents?
11. If 6 men earn 24 dollars, what part of 24 dollars does 1 man earn? How many dollars?
12. At 9 cents a quart, how many quarts of milk can be bought for 63 cents?
13. How do the *solutions* of the last two examples differ?
14. How many yards of cloth, at 7 dollars a yard, can be bought for 70 dollars? For 63 dollars? For 84 dollars?
15. If you divide 84 cents among 7 children, what part of the whole do you give to each? How many cents?
16. A farmer gathered 108 bushels of apples from 9 trees. What was the average number of bushels to each tree?
17. A merchant paid \$96 for 8 pieces of dress goods. What was the cost of each piece?
18. If a farm of 120 acres is divided into 12 equal lots, how many acres does each lot contain?
19. A roll of carpet contains 88 yards. Into how many pieces of 11 yards each can it be cut?

LESSON LXIII.

SUGGESTION: $\$48 \div \$8 = 48$ are how many 8's?
 $\$48 \div \$8 = \frac{1}{8}$ of $\$48$.

1. 68 pecks \div 9 pecks equals how many?
 68 pecks \div 9 equals how many pecks?
2. 72 hours \div 6 hours equals how many?
 72 hours \div 6 equals how many hours?
3. $\$120 \div \12 equals how many?
 $\$120 \div 6$ equals how many dollars?
4. 108 quarts \div 9 quarts equals how many?
 108 quarts \div 12 equals how many quarts?
5. 49 days \div 7 days equals how many?
 49 days \div 7 equals how many days?
6. 56 bbls. \div 8 bbls. equals how many?
 56 bbls. \div 7 equals how many barrels?
7. 132 miles \div 12 miles equals how many?
 132 miles \div 11 equals how many miles?
8. 121 acres \div 11 acres equals how many?
 121 acres \div 11 equals how many acres?
9. $\$54 \div \9 equals how many?
 $\$54 \div 6$ equals how many dollars?
10. 42 quarts \div 7 quarts equals how many?
 42 quarts \div 6 equals how many quarts?
11. 84 rods \div 7 rods equals how many?
 84 rods \div 6 equals how many rods?
12. 45 weeks \div 7 weeks equals how many?
 45 weeks \div 7 weeks equals how many weeks?
13. $\$91 \div \7 equals how many?
 $\$91 \div 7$ equals how many dollars?
14. 78 A \div 6 A equals how many?
 78 A \div 6 equals how many A?
15. 104 lots \div 8 lots equals how many?
 104 lots \div 8 equals how many lots?
16. 144 dozen \div 12 dozen equals how many?
 144 dozen \div 12 equals how many dozen?

LESSON LXIV.

1. How long would it take 6 men to do the work that 8 men do in 9 days?
2. How long would it take 8 men to do what 12 men can do in 8 days?
3. When papers cost at the rate of 24 cents for 8 and are sold at the rate of 60 cents for 12, how many papers must a boy sell in a week to make 30 cents a day?
4. Harper's magazine sells for 85 cents. If the newsdealer pays 28 cents, how many must he sell to make \$5.60 profit?
5. If his profit on Harper's is \$3.60 each month, how many does he sell in a year?
6. Potatoes that cost 50 cents a bushel are sold at 15 cents a peck. How many bushels thus bought and sold will realize to the dealer a profit of \$5? \$10? \$15?
7. If gloves that cost \$36 a dozen pairs are sold for \$42, what is the profit on one pair?
8. At the rate of 8 pencils for 11 cents, what is the price per dozen?
9. If 8 pineapples cost \$1, what will 6 dozen pineapples cost?
10. When corn is purchased at the rate of 7 bushels for \$4.20 and sold at the rate of 6 bushels for \$4.80, how many bushels thus bought and sold would yield a profit of \$40? \$60? \$80.80.
11. How many barrels of apples worth \$3 a barrel would pay for 7 tons of coal at \$6 a ton?
12. How many pounds of butter, worth 20 cents a pound, would pay a store bill of \$10?
13. At 4 cents a piece for oranges, how many can be bought for $\frac{1}{6}$ of \$1.20?
14. 7 barrels of flour are worth \$56. How many barrels of sweet potatoes, worth \$8 a barrel, would be worth as much as 8 barrels of flour?
15. If 8 spring chickens are worth \$1, what are a dozen worth?

LESSON LXV.

$6 \times 3 =$	$\therefore 18 \div 6 =$	$6 \times 11 =$	$\therefore 66 \div 11 =$
	$18 \div 3 =$		$66 \div 6 =$
$7 \times 3 =$	$\therefore 21 \div 7 =$	$7 \times 8 =$	$\therefore 56 \div 8 =$
	$21 \div 3 =$		$56 \div 7 =$
$8 \times 3 =$	$\therefore 24 \div 8 =$	$7 \times 9 =$	$\therefore 63 \div 9 =$
	$24 \div 3 =$		$63 \div 7 =$
$9 \times 3 =$	$\therefore 27 \div 9 =$	$9 \times 5 =$	$\therefore 45 \div 9 =$
	$27 \div 3 =$		$45 \div 5 =$
$6 \times 4 =$	$\therefore 24 \div 6 =$	$9 \times 11 =$	$\therefore 99 \div 11 =$
	$24 \div 4 =$		$99 \div 9 =$
$7 \times 4 =$	$\therefore 28 \div 7 =$	$11 \times 7 =$	$\therefore 77 \div 7 =$
	$28 \div 4 =$		$77 \div 11 =$
$8 \times 4 =$	$\therefore 32 \div 8 =$	$11 \times 12 =$	$\therefore 132 \div 12 =$
	$32 \div 4 =$		$132 \div 11 =$
$9 \times 4 =$	$\therefore 36 \div 9 =$	$12 \times 4 =$	$\therefore 48 \div 4 =$
	$36 \div 4 =$		$48 \div 12 =$
$6 \times 5 =$	$\therefore 30 \div 6 =$	$8 \times 12 =$	$\therefore 96 \div 12 =$
	$30 \div 5 =$		$96 \div 8 =$
$6 \times 6 =$	$\therefore 36 \div 6 =$	$9 \times 4 =$	$\therefore 36 \div 4 =$
			$36 \div 9 =$
$6 \times 7 =$	$\therefore 42 \div 7 =$	$9 \times 9 =$	$\therefore 81 \div 9 =$
	$42 \div 6 =$	$7 \times 7 =$	$\therefore 49 \div 7 =$
$6 \times 8 =$	$\therefore 48 \div 8 =$	$11 \times 11 =$	$\therefore 121 \div 11 =$
	$48 \div 6 =$	$12 \times 12 =$	$\therefore 144 \div 12 =$
$6 \times 9 =$	$\therefore 54 \div 9 =$	$7 \times 12 =$	$\therefore 84 \div 12 =$
	$54 \div 6 =$		$84 \div 7 =$

LESSON LXVI.

Name quotients at sight.

6) 30 54 18 60 24 48 72 12 66 86

7) 85 63 14 28 42 56 77 21 84 70

8) 40 24 48 16 56 96 64 88 32 80

9) 86 18 45 90 27 99 72 54 81 108

Name quotients and remainders at sight.

6) 19 23 26 39 41 27 57 46 58 70

7) 16 20 25 81 87 40 45 50 55 67

8) 19 28 28 81 87 48 47 54 62 70

9) 21 26 31 34 44 50 60 68 75 87

Divide 540 by 6.

SUGGESTION: $540 = 54 \times 10$

6) 54×10
 $9 \times 10 = 90$

Divide 972 by 9.

972 = 900 + 72.

9) $900 + 72$
 $100 + 8 = 108$

6) 180 420 240 480 546 726

7) 210 350 497 280 847 707

8) 640 408 820 960 808 728

9) 450 540 909 918 945 872

LESSON LXVII.

Divide 1792 by 7.

SUGGESTION: $1792 - 1400 + 350 + 42$

7) 1400 + 350 + 42

$$200 + 50 + 6 = 256 \text{ Ans.}$$

1. At \$7 a bbl. for flour, how many barrels can be bought for \$1715?
2. If \$1272 is the price paid for 8 horses, what is the price of one horse?
3. The price paid for 9 house lots was \$9009. What was the price per lot?
4. Four boys received the same wages, which amounted in 6 months to \$2664. What part of the whole does each boy receive? How many dollars?
5. What are the monthly wages of each of the four boys?
6. How many feet are there in 1728 inches?
7. How many bushels are there in 3600 pecks?
8. How many dollars are there in 1880 dimes?
9. How many dimes are there in 1000 cents?
10. How many feet are there in 2448 inches?
11. 9 acres of land cost \$3753. Cost of an acre?
12. What is $\frac{1}{7}$ of \$4949?
13. What is $\frac{1}{7}$ of 8118 miles?
14. A road 468 miles long is divided into 9 equal sections. What is the length of each section?
15. What part of the entire road is one section? 2 sections?
16. A man's income during 8 years was \$17400. What was his yearly income?
17. A man earns \$27000 in 12 years. What does he earn in 1 year?
18. At \$121 for 11 barrels of flour, how much flour can be bought with \$1782?

LESSON LXVIII.

1. 6)	<u>\$ 540</u>	<u>\$54</u>	<u>\$ 5.40</u>	<u>\$.54</u>	<u>\$6.06</u>
2. 7)	<u>\$ 630</u>	<u>\$63</u>	<u>\$ 6.30</u>	<u>\$.63</u>	<u>\$7.70</u>
3. 8)	<u>\$ 48.16</u>	<u>\$ 4.88</u>	<u>\$ 8.72</u>	<u>\$ 16.24</u>	<u>\$.96</u>
4. 9)	<u>\$7218</u>	<u>\$ 7.29</u>	<u>\$ 72.18</u>	<u>\$ 918</u>	<u>\$.81</u>
5. 6)	<u>\$ 4.86</u>	<u>\$48.54</u>	<u>\$4800</u>	<u>\$4812</u>	<u>\$.12</u>
6. 8)	<u>\$9608</u>	<u>\$ 9.60</u>	<u>\$ 96.80</u>	<u>\$ 88.08</u>	<u>\$.08</u>
7. 9)	<u>\$1080</u>	<u>\$10.80</u>	<u>\$ 1.08</u>	<u>\$6354</u>	<u>\$9</u>
8. 6)	<u>\$2149</u>	<u>\$28.85</u>	<u>\$ 4.27</u>	<u>\$ 5.60</u>	<u>\$7.91</u>

9. $457814 \div 7 =$	20. $88762 \div 7 =$
10. $579486 \div 6 =$	21. $92852 \div 8 =$
11. $767856 \div 8 =$	22. $526050 \div 9 =$
12. $824189 \div 9 =$	23. $174968 \div 4 =$
13. $756648 \div 9 =$	24. $768568 \div 8 =$
14. $817685 \div 5 =$	25. $579072 \div 6 =$
15. $178932 \div 6 =$	26. $607080 \div 5 =$
16. $746856 \div 9 =$	27. $728496 \div 6 =$
17. $682844 \div 4 =$	28. $259588 \div 7 =$
18. $675984 \div 7 =$	29. $960504 \div 8 =$
19. $546752 \div 8 =$	30. $10872549 \div 9 =$

LESSON LXIX.

1. Divide 169 by 18.

$$169 = 180 + 39.$$

$$\begin{array}{r} 18)180+39 \\ \underline{162} \\ 18 \end{array}$$

10 + 8 = 18 quotient.

SUGGESTION:

Good teaching does not leave the learner to "*guess work*" in his first steps in division.

In the solution of the examples of this lesson let the necessary reduction be made before the division is performed.

2. Divide 196 by 14.	14. Divide 182 by 18.
3. Divide 225 by 15.	15. Divide 210 by 14.
4. Divide 256 by 16.	16. Divide 240 by 15.
5. Divide 289 by 17.	17. Divide 272 by 16.
6. Divide 324 by 18.	18. Divide 306 by 17.
7. Divide 361 by 19.	19. Divide 342 by 18.
8. Divide 400 by 20.	20. Divide 399 by 19.
9. Divide 441 by 21.	21. Divide 483 by 21.
10. Divide 484 by 22.	22. Divide 528 by 22.
11. Divide 529 by 23.	23. Divide 575 by 23.
12. Divide 576 by 24.	24. Divide 624 by 24.
13. Divide 625 by 25.	25. Divide 700 by 25.

In the following examples lead the pupil to discover the answer before performing the operations indicated.

1. $26 \times 81 \div 18 =$	11. $64 \times 15 \div 16 =$
2. $28 \times 28 \div 14 =$	12. $51 \times 19 \div 17 =$
3. $45 \times 22 \div 15 =$	13. $54 \times 25 \div 18 =$
4. $82 \times 32 \div 16 =$	14. $76 \times 18 \div 19 =$
5. $84 \times 26 \div 17 =$	15. $46 \times 24 \div 23 =$
6. $86 \times 45 \div 18 =$	16. $66 \times 18 \div 22 =$
7. $88 \times 14 \div 19 =$	17. $75 \times 39 \div 25 =$
8. $89 \times 18 \div 18 =$	18. $72 \times 28 \div 24 =$
9. $42 \times 24 \div 14 =$	19. $95 \times 31 \div 19 =$
10. $80 \times 17 \div 15 =$	20. $72 \times 46 \div 18 =$

LESSON LXX.

1. Divide 11271 by 13.

OPERATION:

$$\begin{array}{r}
 867 \\
 \hline
 13)11271 \\
 104 \\
 \hline
 87 \\
 78 \\
 \hline
 91 \\
 91 \\
 \hline
 \end{array}$$

SUGGESTION: To aid the pupil in this most difficult of Third Grade work, let a table of multiples of the divisor be placed before him as a key to the successive figures of the answer sought, thus:

$13 \times 1 = 13$	$13 \times 4 = 52$	$13 \times 7 = 91$
$13 \times 2 = 26$	$13 \times 5 = 65$	$13 \times 8 = 104$
$13 \times 3 = 39$	$13 \times 6 = 78$	$13 \times 9 = 117$

By inspecting the operation in the margin above, it will be seen that the first division is that of 112 hundreds; the second 87 tens; the third 91 ones.

By the aid of the key the pupil is able to see eight 13's in 112, six 13's in 87, and seven 13's in 91. Since the 8 is eight hundreds (why?), the 6 six tens (why?), and the 7 seven ones (why?), each figure is written in its proper place over the dividend.

2. With 13 for the divisor, tell at sight, with the aid of the key, the first figure of the quotient in the following dividends. Also write it in its proper place over the dividend:

858	1948	759	42865
469	2961	876	115882
495	4217	9741	108200
548	5841	10741	105300
687	6793	77600	90400
675	8918	79815	92500

LESSON LXXI.

1. Make a table to serve as a key to the divisor 14, and by its aid tell at sight the figures of the quotients in the following examples:

$$14)106316$$

$$\begin{array}{r} 88 \\ \hline 121 \\ \hline 56 \end{array}$$

$$14)12806$$

$$\begin{array}{r} 110 \\ \hline 126 \\ \hline \end{array}$$

$$14)11926$$

$$\begin{array}{r} 12 \\ \hline 126 \\ \hline \end{array}$$

Test the correctness of your answers by completing the operations.

2. With 15 for a divisor, tell at sight the first quotient figure in the following dividends, and write it in its proper place over the dividend.

2764	4890	6890	10240
2950	5860	7218	11914
3348	568	8314	12360
3785	595	8740	18212
4360	6340	9618	14800

3. With 16 for a divisor, tell at sight the first figure of the quotient in the following dividends:

3865	1147	1880	1596
5021	1518	879	1258
985	1004	1278	1096

4. With 17 for a divisor, tell at sight the first quotient figure:

487	6881	11281	14850
568	7250	12940	16590
984	1503	18460	10851

5. With 18 for a divisor, tell at sight the first quotient figure:

8540	6280	1208	1618
4960	1005	1808	1678
8750	1136	1495	1798

LESSON LXXII.

18)	491	8419	1181	1274	11232
14)	784	1218	10710	12418	1372
15)	1275	1440	6685	7020	9720
16)	896	1248	5586	10960	12624
17)	1071	1479	7956	11101	14948
18)	810	1368	8208	11772	15768
19)	912	1444	6194	12844	15371
20)	1580	1960	6020	16340	13560
21)	4410	8190	12768	16149	18608
22)	1986	9504	14454	17798	19976
23)	1955	2254	6164	17687	21114
24)	1944	2184	7512	16224	20616
25)	6250	1200	19225	20450	23950
24)	21624	2616	14520	20804	19080
19)	1824	11704	17252	18775	5090

LESSON LXXIII.

1. In 1840 eggs how many dozen?
2. If a man, whose salary is \$1500 a year, is paid each month, what is the monthly payment?
3. How many feet in 3468 inches?
4. \$5850 was the price paid for 18 acres of land. What was the price per acre?
5. If \$6.66 is the price paid for 18 lbs. of tea, what is the price per lb.? What would 25 lbs. cost at that price?
6. How many days are there in 648 hours? In 3048 hours?
7. A piano was sold for \$540 on monthly payments of \$15. How many months did it take to pay for the piano? How many years?
8. A lot of 18 front feet sells for \$3816. What is the price per front foot?
9. A lot of 24 feet front sells for \$11282. What is the price per foot?
10. A lot, 20 feet front by 125 feet deep, is quoted at \$4000. What is the price per front foot?
11. At \$48 for 6 ice boxes, what would 25 ice boxes cost?
12. At \$12 for 5 window curtains, what would 15 window curtains cost?
13. Cost of $\frac{1}{3}$ of 68 heifers at \$21 each?
14. Cost of $\frac{1}{7}$ of 68 cows at \$50 a head?
15. The cost of $\frac{1}{8}$ of 96 books is $\frac{1}{9}$ of \$72. What is the price of the books by the dozen?
16. When 6 acres of land are worth \$366, what are 8 acres worth?
17. At \$70 for 10 tons of coal, how many tons can be bought for \$210?
18. At 96 cents for 8 lbs. of beef, how many pounds will \$1.82 pay for?

LESSON LXXIV.

1. *A score* sometimes means 20. How old is a man whose age is three score years and ten?
2. A boy had of marbles a score and a dozen. How many marbles had he?
3. 24 sheets of paper make a quire. A boy had of paper 2 quires and a dozen sheets. How many sheets had he?
4. How many sheets in $\frac{1}{2}$ of a quire? $\frac{1}{3}$? $\frac{1}{4}$? $\frac{1}{6}$? $\frac{1}{8}$? $\frac{1}{12}$?
5. 20 quires of paper make a ream. How many sheets of paper in a ream? How many sheets of paper in $\frac{1}{2}$ ream? $\frac{1}{4}$ ream?
6. If paper is bought at \$2.50 a ream and sold at a cent a sheet, what is the profit on one ream?
7. 8 is one factor of 32. What is the other factor?
8. 8 is one part of 18. What is the other part?
9. What are the factors of 63?
10. 27 is one part of 68. What is the other?
11. Given several numbers to find their sum.
12. Given the sum of two numbers and one of them to find the other.
13. Given the sum of several numbers and all the numbers but one to find that one.
14. Given two numbers to find their difference.
15. Given minuend and subtrahend to find remainder.
16. Given minuend and remainder to find subtrahend.
17. Given subtrahend and difference to find minuend.
18. Given the parts to find the whole.
19. Given the factors to find their product.
20. Given two or more numbers to find their product.
21. Given multiplicand and multiplier to find product.
22. Given product and multiplicand to find multiplier.
23. Given product and multiplier to find multiplicand.

CHAPTER III.

LESSON I.

ORAL PROBLEMS.

1. I buy a book for 12c. and some paper for 8c. How much change should I receive if I give the dealer 25c.?
2. A boy had 15 marbles, found 9, and then lost 8. How many had he left?
3. John put 96 nuts into three piles; into one 14, into another 12. How many were put into the third pile?
4. Joe had 50c. and paid out 20c. for candy and 15c. for a slate. How much did he have left?
5. Having 27 marbles, I gave 12 to a boy and lost 5. How many had I left?
6. Bought a watch for \$80; paid \$40 down and \$20 at another time. How much remained unpaid?
7. A gentleman was paid \$45 for labor. How much had he left after paying \$20 for cloth, \$9 for wood, and \$7 for flour?
8. Bought a watch for \$40, a chain for \$15, and a key for \$3. How much is lost by selling them for \$50?
9. If a pole is 75 feet high and 40 feet are cut off at one time and 20 feet at another, how much is left?
10. A farmer put 18 sheep into one pasture, and 12 into another. How many can he put into the third so that there will be 45 sheep in the three pastures?
11. By taking \$1 to the grocery, how much may you pay for some tea, some cheese, and some oil?
12. Buy some sugar, some coffee and some meat, and pay 75c. for all.
13. A suit costs \$50. If the coat costs \$30 and the vest \$5, what is the cost of the pantaloons?

LESSON II.

1. If \$54 is paid a boy for 9 weeks how much does he receive each week?
2. 1 square yard equals 9 square feet. How many square feet do 8 square yards equal?
3. How many ounces do 8 pounds equal if 1 pound equals 12 ounces?
4. Paid 81 cents for 9 yards of ribbon. What was the price per yard?
5. If 7 men can build a wall in 12 days in what time can 1 man build it?
6. If 1 man can dig a trench in 12 days, in what time can 8 men dig it?
7. A is traveling at the rate of 9 miles an hour. In what time will he complete a journey of 108 miles?
8. B paid \$6 for a vest, and 3 times as much for a coat. How much was paid for both?
9. C rode 9 miles and D 9 times as far. How far did they both ride?
10. The distance from A to B is 68 miles, which is 7 times the distance to C. How far is it to C?
11. A tree is 96 feet in height, which is 8 times the circumference at the base. What is the circumference?
12. A's monthly expenses are \$96 which is 12 times his expenses for car fare. How much does he pay for car fare?
13. A farmer sold 6 tons of hay at \$12 a ton, and received all but \$12 in cash. How much did he receive in cash?
14. A drover sold 7 sheep to one man and 5 to another. At \$9 a head how much should he receive?
15. In what time will a freight train traveling at the rate of 12 miles an hour complete a distance of 132 miles?
16. If \$63 are paid for 7 tons of coal, how much should be paid for 5 tons?

LESSON III.

1. If 3 cords of wood cost \$36, what is the cost of 8 cords?
2. If 4 men can plow a field in 12 days, in what time can 6 men plow it?
3. At \$8 each, what is the cost of $\frac{2}{5}$ of 20 cloaks?
4. In how many days can 5 men reap a field of grain, if 3 men can do it in 10 days?
5. How many tons of coal at \$8 a ton, may be exchanged for 4 barrels of flour at \$6 a barrel?
6. If 6 feet of street pavement cost \$48, what is the cost of 9 feet?
7. How many men can dig a trench in 12 days, if 8 men can dig it in 9 days?
8. How many weeks at \$12 a week, should a man work to pay for 8 tons of coal at \$6 a ton?
9. What is the cost of 7 barrels of flour, if 8 barrels cost \$56?
10. What is the cost of riding 12 miles, if it costs 72 cents to ride 8 miles?
11. At what price per barrel may 6 barrels of flour be exchanged for 9 chairs at \$4 each?
12. If 9 men can mow 45 acres of grass in 1 week, how many acres can 12 men mow in the same time?
13. If 9 boxes of lemons are worth \$54, how much are 7 boxes worth?
14. How many men in 9 days can do as much work as 12 men in 6 days?
15. If 5 pounds of sugar cost 40 cents, what is the cost of $\frac{1}{2}$ of a pound?
16. What is the cost of $\frac{1}{2}$ of 14 tons of coal at \$7 a ton?
17. If 8 men can earn \$320 in 1 month, how much can 12 men earn in the same time?
18. If 8 yards of cloth cost \$7, what is the cost of 21 yards?

SUGGESTION: 21 yards cost 7 times as much as 3 yards.

LESSON IV.

1. If a farmer feeds 12 tons of hay in 6 weeks, how many tons does he feed in 12 weeks?
2. How far can a man walk in $\frac{4}{5}$ of a day, if he walks 20 miles in one day?
3. How many yards of cloth may be bought for \$7, if 86 yards are bought for \$4?
4. Bruce rode 8 hours at the rate of 35 miles in 5 hours. How far did he ride?
5. If 9 men can dig 86 rods of ditch in one day, in how many days can 12 men dig it?
6. In how many weeks can 9 men do as much work as 6 men can in 12 weeks?
7. If 4 men can build a wall in 10 days, how many men can build it in 8 days?
8. If 8 melons are worth 24 oranges, how many melons are worth 36 oranges?
9. If 5 men can paint a house in 12 days, how many men can paint it in $\frac{1}{2}$ of the time?
10. At 8 dimes a foot, what is the cost of 3 yards 1 foot of iron railing?
11. At 1 cent a pound, what is the cost of 1 ton of hay? $\frac{2}{5}$ of a ton?
12. If 3 men can do a piece of work in 8 days, in what time can 8 men do a piece of work twice as large?
13. How much is gained if 3 dozen apples are bought at 8c. a dozen and sold at 1c. each?
14. Two men start from the same point and travel in opposite directions, one 5 miles an hour, the other 7 miles an hour. How far apart are they in 7 hours?
15. Two men start from the same point and travel in the same direction, one 5 miles an hour, the other 12 miles an hour. How far apart are they in 9 hours?

LESSON V.

1. If 10 men can build a wall in 30 days, in what time can 12 men build it?
2. If 20 boys can build a fence in 4 days, how many boys can build it in 10 days?
3. How many men in 4 days can do as much as 8 men can do in 40 days?
4. If 5 men can lay a water pipe in 20 days, how many men can do it in $\frac{1}{2}$ the time?
5. If 6 men can mow a field of grass in 8 days, in what time can 4 men mow $\frac{1}{4}$ as much?
6. How much is the cost of $\frac{2}{3}$ of 15 yards of silk if 7 yards cost \$21?
7. What is the cost of $\frac{3}{4}$ of 12 tables, if 8 tables cost \$72?
8. How many sheep can be bought for \$77 if 6 sheep can be bought for \$11?
9. How many hogs can be bought for \$60 if 8 hogs can be bought for \$10?
10. If 6 chairs cost $\frac{2}{3}$ of \$12 what is the cost of 12 chairs?
11. If 5 caps cost \$8, how many caps can be bought for \$56?
12. A earns $\frac{4}{5}$ of \$15 in 4 days. How much does he earn in 9 days?
13. If 12 men can reap a field of grain in 8 days, in what time can 6 men do it?
14. B earns in 5 days $\frac{3}{4}$ of \$20. How much can he earn in 12 days?
15. If 8 men can plow a field in $\frac{3}{4}$ of 12 days, in what time can 9 men plow it?
16. How many men in 12 days can do as much as 9 men can in $\frac{2}{3}$ of 12 days?
17. If 30 sleds cost \$45, what is the cost of $\frac{2}{5}$ of 9 sleds?

LESSON VI.

1. If 9 men can build a wall in 8 days, how many men can build it in 12 days?
2. How many men can cut a field of grass in 8 days, if 12 men can cut it in 4 days?
3. How many pounds of sugar at 10 cents a pound, may be exchanged for $\frac{1}{5}$ of a barrel of flour at \$5 a barrel?
4. In how many days can 6 men build a wall, if 5 men can do it in 12 days?
5. What is the cost of 32 ounces of tea at \$2 a pound?
6. At \$8 a gallon, what is the cost of 86 quarts of wine?
7. What is the cost of $\frac{1}{9}$ of a hogshead of beer at 12 cents a gallon?
8. At 8 cents an hour, how much can a boy earn in $\frac{3}{8}$ of a day?
9. What is the cost of painting 27 square feet of floor at 12 cents a square yard?
10. At 9 cents a peck, what is the cost of 3 bushels of potatoes?
11. What is the cost of $\frac{1}{8}$ of 15 tons of coal at \$8 a ton?
12. If $\frac{1}{4}$ of a ton of hay cost \$3, what is the cost of 6 tons?
13. What is the cost of 20 oranges, if 8 oranges cost 40 cents?
14. At \$1 a pennyweight, what is the cost of a gold chain that weighs 8 ounces?
15. At 8 cents a quart, what is the cost of 8 gallons of oil?
16. If $\frac{1}{3}$ of a dozen of eggs cost 4 cents, what is the cost of 9 dozen?
17. If $\frac{1}{5}$ of 20 oranges cost 20 cents, what is the cost of 1 dozen?
18. If $\frac{1}{4}$ of 24 sheep cost \$24, what is the cost of 1 dozen?
19. If 4 apples cost 10 cents, what is the cost of 12 apples?
20. What is the cost of 82 caps, if 8 caps cost \$9?

LESSON VII.

1. How many pounds of sugar at 8 cents a pound, may be exchanged for 6 dozen of eggs at 12 cents a dozen?
2. At \$12 a week, how much can a man earn in 12 working days?
3. How much can a boy earn in $\frac{3}{5}$ of an hour, at 1 cent a minute?
4. What is the cost of riding $\frac{2}{5}$ of 15 miles, at the rate of 9 cents a mile?
5. What is the cost of riding 12 miles, at the rate of $\frac{3}{4}$ of 12 cents a mile?
6. At 12 cents a quart, what is the cost of $\frac{1}{2}$ a peck of nuts?
7. If A can earn \$3 in $\frac{1}{3}$ of a day, how much can he earn in 9 days?
8. How far can B travel in 12 hours, if he can travel 4 miles in $\frac{1}{2}$ of an hour?
9. At 12 cents a foot, what is the cost of 3 yards of flooring?
10. What is the cost of 7 quarts of peas, at 12 cents a half-peck?
11. At 12 cents a peck, what is the cost of 3 bushels of oats?
12. What is the cost of 1 peck of beans, at 8 cents a quart?
13. What is the cost of 5 yards of pavement, at \$4 a foot?
14. If 5 horses consume a quantity of oats in 12 days, in what time can 6 horses consume it?
15. At \$1 a cwt. what is the cost of 2 tons of hay?
16. If the heart beats 80 times in $\frac{1}{2}$ of a minute, how many times does it beat in $\frac{1}{6}$ of a minute?
17. If a boy can travel $\frac{1}{3}$ of a distance in 1 hour, in what time can he travel the distance and return?
18. If a barrel of flour last a family of 7 persons 12 weeks, how long will it last a family of 14 persons?
19. How many yards of cloth can be had for \$18, if 12 yards cost \$86?

LESSON VIII.

1. Sold 5 yards of cloth for \$30, thereby losing \$6. What was the cost per yard?
2. What is the cost per pound if 6 pounds of sugar are sold for 60c., thereby gaining 6c.?
3. Bought 4 barrels of flour for \$32 and sold it for \$36. What was the gain per barrel?
4. If 6 quarts of oil cost 60c. and are sold for 72c., how much is gained per quart?
5. If $\frac{2}{3}$ of a pound of rice cost 8 cents, what is the cost of 5 pounds?
6. If $\frac{2}{5}$ of a cord of wood cost \$4, what is the cost of 9 cords?
7. If 12 pencils cost 80 cents, what is the cost of 2 pencils?
SUGGESTION: 2 pencils cost $\frac{1}{6}$ as much as 12 pencils.
8. If 15 oranges cost 35 cents, what is the cost of 3 oranges?
9. If 7 tops cost 12 cents, what is the cost of 35 tops?
10. What is the cost of 9 hats, if 27 hats cost \$36?
11. What is the cost of 4 pictures, if 16 pictures cost \$48?
12. If 28 books cost \$20, what is the cost of 7 books?
13. What is the cost of 12 chains, if 36 chains cost \$24?
14. What is the cost of 7 head of sheep, if 56 head cost \$96?
15. How far does a man walk in 3 days if he walks 108 miles in 27 days?
16. B travels 12 hours at the rate of 36 miles in 9 hours. How far did he travel?
17. How much can C earn in 8 days, if he can earn \$60 in 40 days?
18. If $\frac{3}{4}$ of a ton cost \$6, what is the cost of 9 tons?
19. If 6 lemons are worth 9 peaches, how many peaches are 24 lemons worth?

LESSON IX.

1. $\frac{3}{4}$ of \$24 is \$4 more than was paid for a ton of hay. How much did it cost?
2. \$5 more than $\frac{2}{3}$ of \$32 was paid for a suit. How much did it cost?
3. Mr. A set off for a field $\frac{4}{5}$ of 35 acres and 8 acres more. How many acres were in the field?
4. $\frac{5}{8}$ of \$56 is \$5 less than the cost of a watch. What is the cost of the watch?
5. $\frac{4}{7}$ of \$70 is \$10 less than the price of my suit. What is the cost of my suit?
6. $\frac{5}{9}$ of 81 acres is 10 acres more than is in my orchard. How many acres are in the orchard?
7. $\frac{5}{7}$ of 84 miles is 10 miles more than B traveled yesterday. How far did he travel yesterday?
8. C gave \$96 for a watch and $\frac{5}{12}$ as much less \$8 for a chain. How much was given for the chain?
9. D having 144 cattle sold $\frac{7}{12}$ of them less 14 cattle. How many cattle were sold?
10. E is 63 years old and his wife $\frac{7}{9}$ as old and 10 years more. How old is the wife?
11. A gentleman had \$108 in bank and $\frac{7}{9}$ as much and \$16 more in his pocket. How much has he in his pocket?
12. $\frac{3}{5}$ of \$63 was paid for 9 yards of silk. What is the cost per yard?
13. $\frac{5}{8}$ of \$96 was paid for 12 barrels of flour. How much was paid per barrel?
14. If $\frac{7}{9}$ of \$72 is paid for 8 tons of coal, what is the price per ton?
15. $\frac{5}{12}$ of 96 years is 4 times John's age. How old is he?
16. $\frac{5}{7}$ of \$63 is 9 times the cost of my hat. What is the cost of it?

LESSON X.

1. If $\frac{1}{2}$ a box of candy cost 9 cents, what is $\frac{1}{8}$ of a box worth?
2. What is the cost of $\frac{1}{4}$ of a pound of butter, if $\frac{1}{2}$ a pound cost 12 cents?
3. If $\frac{1}{8}$ of a pound of nuts cost 8 cents, what is the cost of $\frac{1}{4}$ of a pound?
4. What is $\frac{1}{5}$ of the distance from A to B, if $\frac{1}{8}$ of the distance is 10 miles?
5. If $\frac{1}{4}$ of a field contains 9 acres, how many acres does $\frac{1}{3}$ of the field contain?
6. What is $\frac{1}{6}$ of A's journey, if $\frac{1}{4}$ of the distance is 12 miles?
7. If $\frac{1}{5}$ of B's age is 8 years, what is $\frac{1}{4}$ of his age?
8. What is $\frac{1}{6}$ of C's money, if $\frac{1}{5}$ of it is \$12?
9. If $\frac{1}{6}$ of an acre of ground is worth \$6, what is $\frac{1}{4}$ of an acre worth?
10. What is $\frac{1}{9}$ of the height of a tower, if $\frac{1}{6}$ of the height is 12 feet?
11. If $\frac{1}{7}$ of the width of a street is 9 feet, what is $\frac{1}{9}$ of the width?
12. What is $\frac{1}{2}$ of the cost of a gentleman's suit, if $\frac{1}{7}$ of the cost is \$12?
13. If $\frac{1}{8}$ of a piece of work can be done in 6 days, in what time can $\frac{1}{4}$ of it be done?
14. What is $\frac{1}{2}$ of a trip to Salt Lake, if $\frac{1}{8}$ of the cost is \$9?
15. If $\frac{1}{9}$ of the cost of building a wall is \$4, what is $\frac{1}{8}$ of the cost?
16. What is $\frac{1}{2}$ of the number of men in a military company, if $\frac{1}{9}$ of the number is 8 men?
17. If $\frac{1}{2}$ of the cost of a trip to San Francisco is \$9, what is $\frac{1}{9}$ of the cost?

LESSON XI.

1. If $\frac{1}{4}$ of a pound of coffee cost 8 cents, what is the cost of $\frac{3}{4}$ of a pound?
2. If $\frac{1}{5}$ of a peck of apples cost 9 cents, what is the cost of $\frac{4}{5}$ of a pound?
3. If $\frac{1}{3}$ of a yard of cloth cost 7 cents, what is the cost of $\frac{2}{3}$ of a yard?
4. What is the cost of $\frac{5}{6}$ of a bushel of corn, if $\frac{1}{6}$ of a bushel cost 8 cents?
5. How far can a man ride in $\frac{4}{6}$ of a day, if he can ride 9 miles in $\frac{1}{6}$ of a day?
6. What is the cost of $\frac{5}{7}$ of a pound of tea, if $\frac{1}{7}$ of a pound cost 9 cents?
7. If $\frac{1}{7}$ of a man's monthly wages is \$12, what are his wages for $\frac{5}{7}$ of a month?
8. If $\frac{1}{8}$ of a hogshead of sugar is worth \$8, how much is $\frac{5}{8}$ of a hogshead worth?
9. What is the cost of $\frac{7}{8}$ of an acre, if $\frac{1}{8}$ of an acre cost \$12?
10. If $\frac{1}{9}$ of A's age is 7 years, what is $\frac{7}{9}$ of his age?
11. What is $\frac{8}{9}$ of the distance from E to F, if $\frac{1}{9}$ of the distance is 12 miles?
12. If $\frac{1}{10}$ of a field contains 8 square rods, what does $\frac{7}{10}$ of a field contain?
13. What is the area of $\frac{9}{10}$ of a grass plat, if $\frac{1}{10}$ of it is 12 square rods?
14. If 9 sheep is $\frac{1}{11}$ of a certain flock of sheep, how many are $\frac{8}{11}$ of the flock?
15. What is $\frac{9}{11}$ of the number of trees in an orchard, if $\frac{1}{11}$ is 12 trees?
16. If $\frac{1}{12}$ of a road can be repaired in 8 days, in what time can $\frac{7}{12}$ of it be repaired?

LESSON XII.

1. If $\frac{1}{2}$ of a quart of molasses costs 12 cents, what is the cost of $\frac{2}{3}$ of a quart?
2. What is the cost of $\frac{3}{4}$ of a pound of butter, if $\frac{1}{3}$ of a pound cost 8 cents?
3. If $\frac{1}{4}$ of a dozen of oranges cost 8 cents, what is the cost of $\frac{3}{8}$ of a dozen?
4. What is $\frac{1}{9}$ of the height of a house, if $\frac{1}{4}$ of the height is 9 feet?
5. If $\frac{1}{6}$ of a field of grass is worth \$8, what is the value of $\frac{5}{8}$ of it?
6. What is $\frac{5}{6}$ of C's age, if $\frac{1}{6}$ of his age is 12 years?
7. If $\frac{1}{6}$ of a grocer's sales for one day is \$8, what is $\frac{3}{4}$ of the sales?
8. What is $\frac{7}{9}$ of my money if $\frac{1}{6}$ of it is \$12?
9. If $\frac{1}{7}$ of a quantity of linen costs \$9, what is the cost of $\frac{5}{9}$ of it?
10. What is $\frac{7}{12}$ of the cost of a watch, if $\frac{1}{7}$ of the cost is \$12?
11. If $\frac{1}{8}$ of a crate of lemons is worth \$9, what is $\frac{5}{6}$ of the crate worth?
12. What is $\frac{7}{12}$ of the value of a quantity of wheat, if $\frac{1}{8}$ of the quantity is worth \$12?
13. If $\frac{1}{9}$ of the cost of a suit of clothes is \$4, how much is $\frac{5}{6}$ of the cost?
14. What is $\frac{5}{12}$ of B's farm if $\frac{1}{9}$ of the farm is 8 acres?
15. If $\frac{1}{11}$ of a sale of flour yields \$7, what is the yield of $\frac{5}{7}$ of the sale?
16. What is $\frac{7}{12}$ of the height of a flag staff, if $\frac{1}{12}$ of the height is 12 feet?
17. If $\frac{1}{12}$ of John's weight is 6 pounds, what is $\frac{7}{8}$ of his weight?

LESSON XIII.

1. How far can A travel in $\frac{2}{3}$ of a day, if he can travel 9 miles in $\frac{1}{3}$ of a day?
2. If a boy can earn 12c. in $\frac{1}{4}$ of an hour, how much can he earn in $\frac{2}{3}$ of an hour?
3. How much greater is $\frac{3}{4}$ of 36 miles than $\frac{2}{3}$ of it?
4. If a man can earn \$60 a month, how much more can he earn in $\frac{4}{5}$ than in $\frac{7}{12}$ of a month?
5. If a boat sails 60 miles in 5 hours, how far does it sail in $\frac{2}{3}$ of an hour?
6. How far does a train move in 12 minutes at the rate of 60 miles an hour?
7. If a man earns \$108 in 9 weeks, how much does he earn each working day?
8. If $\frac{1}{4}$ of an acre yield 9 bushels of wheat, what is the yield of $\frac{2}{3}$ of an acre?
9. $\frac{3}{8}$ of 24 miles is $\frac{1}{8}$ of the distance from A to B. How far is it from A. to B?
10. $\frac{2}{7}$ of a man's age, which is 28 years, is 3 times the age of his son. How old is the son?
11. $\frac{2}{7}$ of \$21 is $\frac{1}{4}$ of the cost of a suit of clothes. What is the cost of the suit?
12. $\frac{5}{8}$ of \$40 is 5 times the cost of my hat. What is the cost of the hat?
13. $\frac{7}{9}$ of a hogshead of wine is 7 times what A bought. How much did he buy?
14. $\frac{7}{12}$ of 108 years is 9 times John's age. How old is he?
15. $\frac{2}{9}$ of \$54 is $\frac{1}{7}$ of B's money. How much money has he?
16. $\frac{7}{12}$ of an hour is 5 times how many minutes?

LESSON IVX.

ORAL PROBLEMS.

SEE TABLE OF U. S. MONEY.

1. 4 cents 5 mills equal how many mills? 8 cents 7 mills?
2. 36 mills equal how many cents? 58 mills? 79 mills?
3. $\frac{1}{4}$ of 48 mills equals how many cents? $\frac{1}{3}$ of 60 mills?
4. 5 dimes 7 cents equal how many cents? 12 dimes 5 cents?
5. 28 cents equal how many dimes? 47 cents? 84 cents?
6. $\frac{1}{4}$ of 40 cents equals how many mills? $\frac{1}{3}$ of 24 cents?
7. $\frac{1}{5}$ of 45 cents equals how many mills? $\frac{2}{5}$ of 40 cents?
8. 8 mills is what part of 4 cents? 5 mills? 4 mills?
9. 5 cents is what part of 4 dimes? 8 cents? 4 cents?
10. \$8 and 4 dimes equal how many dimes? \$9 and 7 dimes?
11. 85 dimes equal how many dollars? 66 dimes?
12. $\frac{3}{8}$ of 4 dimes is how much greater than 12 cents?
13. 12 cents is $\frac{1}{5}$ of how many dimes? $\frac{1}{3}$ of how many dimes?
14. 60 dimes equal 5 times how many cents? 6 times?
15. $\frac{1}{2}$ of a dollar is how much greater than 4 dimes?
16. $\frac{1}{4}$ of a dollar is how much greater than $\frac{1}{6}$ of a dollar?
17. $\frac{3}{5}$ of a dollar equals how many dimes? How many cents?
18. $\frac{2}{5}$ of a dollar is how much greater than $\frac{1}{2}$ of a dollar?
19. $\frac{3}{4}$ of a dollar equal how many cents? How many dimes?
20. 8 mills is what part of 7 cents 2 mills? 9 cents 6 mills?
21. 12 cents is what part of 4 dimes 8 cents? 8 dimes 4 cents?
22. \$5 and 4 dimes equal how many dimes? \$9 and 5 dimes?

LESSON XV.

SEE TABLE OF LONG MEASURE.

1. 9 feet 6 inches equal how many inches? 12 feet 8 inches?
2. 135 inches equal how many feet? 159 inches?
3. $\frac{2}{3}$ of a foot equals how many inches? $\frac{3}{4}$ of a foot?
4. 2 rods equal how many yards? 4 rods?
5. 2 rods equal how many feet? 3 rods?
6. $\frac{1}{4}$ of 8 feet equals how many inches? $\frac{1}{6}$ of 5 feet?
7. $\frac{3}{8}$ of a mile equals how many rods? $\frac{3}{4}$ of a mile?
8. $\frac{5}{8}$ of a mile equals how many rods? $\frac{7}{8}$ of a mile?
9. 5 inches is what part of a foot? 9 inches?
10. 3 feet is what part of 2 yards? 5 yards?
11. 9 inches is what part of 3 feet? 12 inches?
12. $\frac{3}{4}$ of 1 yard equals how many inches? $\frac{1}{6}$ of 2 yards?
13. $\frac{3}{8}$ of a mile is how much greater than 100 rods?
14. How much less is 20 feet than 12 yards?
15. How much greater is 75 inches than 6 feet?
16. 80 rods is what part of a mile? 64 rods?
17. What is the cost of fencing $\frac{5}{8}$ of a mile at \$2 a rod?
18. $\frac{2}{3}$ of a foot equals $\frac{1}{6}$ of how many inches?
19. $\frac{2}{4}$ of a foot equals $\frac{1}{4}$ of how many yards?
20. $\frac{1}{8}$ of a mile equals $\frac{1}{3}$ of how many rods?
21. 1 rod equals how many half-yards? 3 rods?
22. 1 yard equals how many half-feet? Third-feet?
23. 12 half-feet equal how many yards? 24 third-feet?
24. 9 inches equal $\frac{1}{8}$ of how many feet?
25. 9 feet equal $\frac{1}{4}$ of how many yards?
26. 1 mile equals 8 times how many rods?

LESSON XVI.

SEE TABLE OF DRY MEASURE.

1. 5 quarts 1 pint equal how many pints? 9 quarts 1 pint?
2. 8 pints equals what part of 6 quarts? Of 9 quarts?
3. 4 pints equal $\frac{1}{6}$ of how many quarts? $\frac{1}{6}$? $\frac{1}{8}$?
4. 7 pecks 5 quarts equal how many quarts? 9 pecks 6 quarts?
5. 3 quarts equal what part of 1 peck? 4 quarts?
6. 5 quarts equal $\frac{1}{8}$ of how many pecks? 9 quarts?
7. 1 peck equals what part of 82 quarts? 48 quarts?
8. 8 pecks equal 6 times how many quarts? 6 pecks?
9. 70 quarts equal how many pecks? 100 quarts?
10. 8 bushels 3 pecks equal how many pecks?
11. 39 pecks equal how many bushels? 50 pecks?
12. 6 pecks equal what part of 8 bushels? Of 9 bushels?
13. 9 pecks equal $\frac{1}{4}$ of how many bushels? 12 pecks?
14. 8 bushels equal 12 times how many quarts?
15. Since 1 bushel of wheat weighs 60 pounds, $\frac{1}{6}$ of a bushel weighs how many pounds? $\frac{8}{5}$?
16. 5 bushels equal how many pounds? 10 bushels?
17. 10 pounds equals what part of a bushel? 80 pounds?
18. What is the cost of 1 bushel of wheat at 2 c. a pound?
19. What is the weight of 2 pecks of wheat? 8 pecks?
20. What is the weight of 1 bushel 2 pecks of wheat?
21. 6 bushels equal 8 times how many pecks?
22. 12 pecks equal $\frac{1}{2}$ of how many bushels? $\frac{1}{8}$? $\frac{1}{4}$?
23. 12 quarts equal $\frac{1}{2}$ of how many pecks? $\frac{1}{4}$? $\frac{1}{6}$?
24. 48 pecks equal 6 times how many bushels? 12 times?
25. 1 peck equals how many pints? 8 pecks?

LESSON XVII.

SEE TABLE OF AVOIRDUPOIS WEIGHT.

1. 2 pounds 8 ounces equal how many ounces? 5 pounds 10 ounces?
2. How many pounds equal 48 ounces? 70 ounces?
3. $\frac{1}{2}$ of a pound equals how many ounces? $\frac{1}{4}$ of a pound?
4. $\frac{3}{4}$ of a pound equals how many ounces? $\frac{1}{8}$ of a pound?
5. $\frac{2}{3}$ of a pound equals how many ounces? $\frac{5}{6}$ of a pound?
6. How much greater is 8 pounds than 36 ounces?
7. 3 cwt. equals how many pounds? 5 cwt.? 12 cwt.?
8. $\frac{1}{2}$ cwt. equals how many pounds? $\frac{1}{4}$ cwt.? $\frac{3}{4}$ cwt.?
9. $\frac{1}{6}$ cwt. equals how many pounds? $\frac{2}{5}$ cwt.? $\frac{4}{5}$ cwt.?
10. What part of a pound is 8 ounces? 12 ounces?
11. What part of 2 pounds is 4 ounces? 8 ounces?
12. 2 tons equal how many cwt.? 4 tons? 5 tons?
13. $\frac{1}{2}$ ton equals how many cwt.? $\frac{1}{4}$ ton? $\frac{1}{6}$ ton?
14. $\frac{3}{4}$ ton equals how many cwt.? $\frac{3}{5}$ ton? $\frac{4}{5}$ ton?
15. What part of a cwt. is 10 pounds? 20 pounds?
16. What part of a cwt. is 25 pounds? 30 pounds?
17. How many pounds less is 15 cwt. than 1 ton?
18. How much greater is 1 cwt. than 75 pounds?
19. 9 ounces is what part of 1 pound? Of 2 pounds?
20. 2 tons equals how many cwt.? How many pounds?
21. $\frac{1}{4}$ of a ton equals how many pounds? $\frac{1}{6}$ of a ton?
22. $\frac{2}{3}$ of a ton equals how many pounds? $\frac{3}{5}$ of a ton?
23. How much greater is $\frac{2}{3}$ of a ton than 9 cwt.?
24. 8 ounces equal $\frac{1}{6}$ of how many pounds? 12 ounces?
25. 60 pounds equal $\frac{1}{5}$ of how many cwt.? 40 pounds?
26. 12 cwt. equal $\frac{1}{5}$ of how many tons? 8 cwt.?

LESSON XVIII.

SEE TABLE OF TIME.

1. $\frac{1}{4}$ of a minute equals how many seconds? $\frac{3}{5}$?
2. How many minutes equal $\frac{1}{6}$ of an hour? $\frac{4}{5}$?
3. What part of an hour are 20 minutes? 30 minutes?
4. 10 minutes equal $\frac{1}{12}$ of how many hours?
5. $\frac{3}{5}$ of an hour is how much greater than 30 minutes?
6. 5 hours 30 minutes equal how many minutes?
7. $\frac{5}{6}$ of a day is how much greater than $\frac{5}{8}$ of a day?
8. 2 days 2 hours equal how many hours?
9. 89 days equal how many weeks? 84 days?
10. 9 weeks 5 days equal how many days?
11. $\frac{3}{4}$ of a year is how much less than 1 year 6 months?
12. 7 months is what part of 5 years and 8 months?
13. 12 hours equal $\frac{1}{6}$ of how many days?
14. 2 days equal 8 times how many hours?
15. How many days, omitting Sundays, equal 12 weeks?
16. $\frac{3}{4}$ of a day is how much greater than $\frac{1}{2}$ of a day?
17. 9 months equal what part of 3 years? 9 years?
18. 8 months equal $\frac{1}{6}$ of how many years?
19. $\frac{1}{2}$ of a century equals how many years?
20. $\frac{3}{4}$ of a century is how much greater than 50 years?
21. $\frac{2}{5}$ of a century is how much less than 50 years?
22. 56 months equal how many years? 79 months?
23. 59 days equal how many weeks? 89 days?
24. 8 weeks is how much less than 30 days?
25. 9 years is 8 months greater than how many months?
26. 8 weeks is 6 days less than how many days?

LESSON XIX.

SEE TABLE OF LIQUID MEASURE.

1. 8 pints 3 gills equal how many gills? 12 pints 2 gills?
2. 47 gills equal how many pints? 50 gills?
3. $\frac{1}{2}$ of a pint equals how many gills? $\frac{3}{4}$ of a pint?
4. 8 quarts 1 pint equal how many pints? 12 quarts?
5. $\frac{1}{3}$ of 6 quarts equals how many pints? Of 9 quarts?
6. $\frac{1}{8}$ of 10 pints equals how many gills? Of 12 pints?
7. How much less is $\frac{1}{6}$ of 12 pints than 8 quarts?
8. 6 gallons 3 quarts equal how many quarts? 12 gallons?
9. 80 quarts equal how many gallons? $\frac{1}{4}$ of 48 quarts?
10. What part of 8 gallons is 3 quarts? Of 6 gallons?
11. $\frac{1}{7}$ of a hogshead equals how many gallons? $\frac{3}{7}$?
12. $\frac{4}{7}$ of a hogshead is how much greater than 25 gallons?
13. $\frac{4}{9}$ of a hogshead is how much less than $\frac{4}{7}$ of a hogshead?
14. 1 hogshead equals how many barrels? $\frac{1}{2}$ of a hogshead?
15. 4 hogsheads equal how many barrels? 10 hogsheads?
16. How much greater is 4 hogsheads than 7 barrels?
17. 5 quarts equal what part of 5 gallons? Of 10 gallons?
18. 7 gallons equal what part of 1 hogshead? 9 gallons?
19. 12 gallons equal what part of $\frac{4}{7}$ of a hogshead?
20. 5 gallons equal what part of $\frac{5}{9}$ of a hogshead?
21. 39 quarts equal how many gallons? 47 quarts?
22. How much greater is $\frac{2}{3}$ of a hogshead than 48 quarts?
23. 4 quarts equal $\frac{1}{5}$ of how many gallons?
24. 21 gallons equal $\frac{1}{3}$ of how many hogsheads?
25. 12 gallons equal 6 times how many quarts?

LESSON XX.

SEE TABLE OF TROY WEIGHT.

1. 9 pounds 4 ounces equal how many ounces?
2. 150 ounces equal how many pounds? 100 ounces?
3. 9 ounces equal what part of 8 pounds? Of 6 pounds?
4. 6 ounces equal $\frac{1}{6}$ of how many pounds? $\frac{1}{2}$?
5. 4 ounces 10 pennyweights equal how many pennyweights?
6. 70 pennyweights equal how many ounces? 90 pwt.?
7. $\frac{1}{5}$ of 8 ounces equal how many pennyweights?
8. $\frac{1}{4}$ of 8 pounds equal how many ounces?
9. $\frac{3}{4}$ of 2 pounds equal how many ounces?
10. 12 pennyweights equal $\frac{1}{6}$ of how many ounces?
11. $\frac{3}{4}$ of a pennyweight equal how many grains?
12. $\frac{2}{3}$ of a pennyweight is how much greater than 12 grains?
13. 12 pennyweights equal what part of 8 ounces?
14. 10 pennyweights equal $\frac{1}{8}$ of how many ounces?
15. 12 grains equal what part of 3 pennyweights?
16. 8 grains equal $\frac{1}{6}$ of how many pennyweights?
17. 12 grains equal $\frac{1}{6}$ of how many pennyweights?
18. 240 grains equal how many pennyweights?
19. 1 gold dollar weighs 1 pwt. What is the value of gold dollars that weigh $\frac{1}{2}$ of an ounce?
20. What is the value of gold dollars that weigh 1 pound?
21. What is the value of gold dollars that weigh $\frac{1}{2}$ of a pound?
22. At \$1 a pwt. what is the value of a gold chain that weighs 2 ounces?
23. 1 silver dollar weighs 1 oz. What is the value of silver dollars that weigh $\frac{1}{2}$ pound?
24. What is the value of silver dollars weighing 5 pounds

LESSON XXI:

NOTATION AND NUMERATION.*

Read:

1.	2.	3.
\$100.01	\$1000.10	\$ 200200.20
\$500.05	\$1500.05	\$ 117803.19
\$900.09	\$2050.05	\$ 2002020.02
\$404.40	\$4004.40	\$ 5380409.75
\$180.18	\$6600.60	\$ 8716580.90
\$227.105	\$7017.71	\$ 745400.08
\$808.088	\$8800.08	\$ 27685.14
\$650.501	\$9500.	\$25025025.
\$770.07	\$4872.16	\$ 6006006.
\$707.70	\$5055.005	\$60060060.

Read:

1. 180 mi., 45 rds., 12 ft., 6 in.
2. 14 mi., 27 rds., $4\frac{1}{2}$ yds., $8\frac{2}{3}$ ft., 5 in.
3. 120 A., 40 sq. rds., $20\frac{1}{4}$ sq. yds., 6 sq. ft.
4. 14 sq. rds., 15 sq. yds., 3 sq. ft., 120 sq. in.
5. 5 sq. mi., 40 A., 40 sq. rds.
6. 20 cu. ft., 144 cu. in.
7. 18 cu. yds., 18 cu. ft., 25 cu. in.
8. 4 gals., 3 qts., 2 pts.
9. 10 bu., 3 pks., 5 qts., 1 pt.
10. 17 T., 14 cwt., 25 lbs., 8 oz.
11. 100 yr., 200 da., 4 hr.
12. 5 wk., 6 d α ., 5 hr., 40 min., 20 sec.
13. A. D. 1865, A. D. 1885.
14. A. D. Sept. 1, 1885, 9 o'clock A. M., 12 o'clock.
15. Rome was founded 753 B. C.
16. Carthage was destroyed B. C. 146.

*See Lessons XXIV and XXV, Chap. II.

LESSON XXII.

Group the following into periods and read :

SUGGESTION: In grouping into periods *do not use the comma.*

1. 1 000 090	2. 100 000 000	3. 17 175 846
1 001 001	125 000 125	414 570 184
1 010 010	400 000 400	29 408 509
1 100 100	404 404 000	216 457 579
10 010 010	20 020 020	49 049 049
10 100 001	16 160 106	180 108 118
10 900 909	100 100 100	410 415 000
90 900 009	100 010 001	27 028 029
25 450 465	107 017 170	14 014 014
19 190 109	40 400 004	140 114 104

Write, grouping into periods; then read from slate or blackboard:

1. 5 thousand, five.
2. 50 thousand, five.
3. 500 thousand, 5 hundred.
4. 548 thousand, twenty-five.
5. 1 million, 1 thousand, one.
6. 10 million, 10 thousand, ten.
7. 25 million, 25 thousand, 25.
8. 100 million, 100 thousand, 100.
9. 17 million, 7 thousand, 170.
10. 808 million, 80 thousand, 8.
11. 175 million, 190 thousand, 200.
12. 1 billion, 100 million, 100 thousand.
13. 1 billion, 19 million, 17 thousand, 7.
14. 1 billion, 506 million, 560 thousand, 500.
15. Eighteen hundred, eighty-five.
16. Ten hundred thousand.
17. A thousand millions.

LESSON XXIII.

ADDITION.

Addition in Arithmetic is the name of an operation by which two or more numbers of the same kind are united into one equivalent number called the *Sum* or *Amount*.

1. What is the sum of 748 lbs., 496 lbs., 824 lbs., 657 lbs. and 590 lbs.?
2. What is the sum of 1840 mi., 1492 mi., 1620 mi., 2240 mi. and 968 mi.?
3. What is the sum of \$9628, \$786, \$791, \$9927 and \$684?
4. What is the sum in days of 8 years of 365 days, and 1 year of 366 days?
5. What is the aggregate weight of 8 bu. barley, 48 lbs. each; 8 bu. corn, 52 lbs. each; 8 bu. corn meal, 48 lbs. each; 8 bu. wheat, 60 lbs. each?
6. What is the aggregate weight of 8 bbls. flour, 196 lbs. each; 2 bbls. salt, 280 lbs. each?
7. What is the sum in hours of 4 weeks of 7 days each? 4 working weeks of 6 days each? 4 school weeks of 5 days each?
8. How many days are there from the 26th of June to the 1st of September inclusive?
9. What is the sum of \$18.49, \$9.075, \$36.47, \$7.098 and \$67.875?
10. What is the sum of 98, 4640, 896, 7859 and 87?
11. How many days are there from September 1 to June 30 inclusive?
12. Five men enter into business together. A furnishes \$8770, B \$5875, C as much as A and B less \$1500, D as much as B and C, E as much as A and D. What is their *united capital*?

LESSON XXIV.

For proof of accuracy, see Lesson XXXII Chapter II.

1.	2.	3.	4.
68046	18222	74564	217845
46258	12818	27892	166459
86048	81859	83571	225224
05187	22441	13456	806892
47846	14821	85688	102755
99008	22720	80907	214658
28944	86642	65586	157672

5.	6.	7.	8.
15088	26881	41919	99808
7404	89665	19577	41871
34971	88249	74736	110525
80859	6318	66768	102936
6298	4318	7193	17087
2875	84705	51365	13251
64984	80597	155497	220619
16147	29997	52889	86160

9.	10.	11.	12.
80901	95299	183184	225255
7444	59806	16845	68940
57068	18647	85902	176974
17255	41609	82182	86590
82548	85077	75158	149162
58068	46880	182985	109855
88860	41842	82989	288910
17548	26876	44424	72908
88556	44805	83271	119557
89058	89744	78861	117781

LESSON XXV.

1. Bought flour for \$8796, coal for \$9875, hardware for \$25675 and agricultural implements for \$19568. Sold the flour at a profit of \$786, the coal at a profit of \$975, the hardware at a profit of \$5780 and the agricultural implements at cost. What were the total receipts?
2. Bought grain for \$7475, and sold it at an advance of \$496; groceries for \$5789, and sold at an advance of \$578.90; other merchandise for \$4850, and sold at an advance of $\frac{1}{2}$ the cost. What was the amount of sales?
3. A fifty foot lot was purchased at \$50 a foot. Two houses were erected thereon at a cost of \$5068 each. The property was sold at an advance of \$3875 on the cost. What was the selling price?
4. A has \$938 which is $\frac{1}{2}$ of B's money. C has as much as A and B. How many dollars have A, B and C together?
5. A farmer bought a farm paying \$2375 down. After making two more payments of \$1096 and \$1260 he still owed \$896. What was the price of the farm?
6. Six loads of hay weigh as follows: 3648 lbs., 1949 lbs., 2783 lbs., 2548 lbs., 3140 lbs. and 2987 lbs. What is the entire weight of the six loads?
7. A man had \$3640. By trading in live stock he added to his capital \$1575. How much more will enable him to pay for a farm worth \$10000?
8. The distance from Chicago to Appleton, Wis., is 185 miles; from Chicago to Ashland, on Lake Superior, 483 miles; from Chicago to Devil's Lake, 178 miles; from Chicago to Escanaba, Mich., 357 miles; from Chicago to Lake Madison, Minn., 421 miles. How many miles would a Chicago traveling agent ride in visiting all these places, returning to Chicago from each point?

LESSON XXVI.

The columns of figures in this lesson represent the cost of fuel for the schools of Chicago for the year 1883-1884. What was the total cost?

1.	2.	3.	4.
\$ 143.50	\$ 418.11	\$ 633.98	\$ 782.55
1174.69	770.64	628.	478.76
909.12	546.34	877.56	218.20
584.08	1017.55	971.21	705.79
602.45	849.34	688.62	978.77
474.34	758.88	546.53	684.92
891.88	712.99	601.82	690.05
487.41	989.88	591.85	589.15

5.	6.	7.	8.
\$ 611.89	\$ 530.81	\$ 530.81	\$ 655.03
272.86	670.88	726.45	1067.89
628.42	670.06	772.59	709.53
517.41	434.21	1115.59	872.72
530.09	708.81	692.55	701.55
655.44	521.69	478.42	972.02
807.38	540.	592.42	682.57
2184.69	684.89	487.78	845.03

9. Grain was sold as follows: 9860 bu. of wheat for \$3286.33; 8756 bu. of corn for \$4878; 12845 bu. oats for \$4281.67; 1896 bu. of rye for \$982; 786 bu. of barley for \$893. How many bu. of grain were sold and for how much?

10. The heights of 10 mountain peaks in North America are given in feet as follows: 17900, 16000, 15500, 14898, 14447, 14444, 14271, 14147, 13570 and 11225. What would be the length of a line that would measure the united heights of these mountains.

LESSON XXVII.

The columns in this lesson contain the number of pupils enrolled in the Chicago schools during the year 1883-84. What was the total enrollment?

1.	2.	3.	4.
805	1675	1409	1522
479	460	1216	1001
751	1746	2452	654
1508	1504	900	1156
728	1057	1180	225
2177	1750	1499	1641
1160	1737	1238	<u>1025</u>
<u>1042</u>	<u>1085</u>		
5.	6.	7.	8.
1429	1004	1593	1791
224	1051	488	1472
1860	1150	1463	1814
1056	1001	1966	197
1050	1173	698	1791
1516	1276	1110	1848
1386	1287	1221	<u>1726</u>
<u>1981</u>	<u>1225</u>	<u>139</u>	

9. How many men in an army consisting of 52714 infantry, 5110 cavalry, 6250 dragoons, 8927 light-horse, 928 artillery, 250 sappers, and 406 miners?

10. Five persons deposited money in the same bank; the first, \$5897; the second, \$12980; the third, \$65973; the fourth, \$87845, and the fifth as much as the first and second together; how many dollars did they all deposit.

11. A has \$3648, B has \$7085, C has \$429 more than A and B together, and D has as much as all the rest. How many dollars has D? How many have all?

LESSON XXVIII.

1. Find the sum of $\frac{1}{6}$ of 360 days, $\frac{2}{3}$ of 180 days, $\frac{4}{5}$ of 800 days, and $\frac{5}{6}$ of 720 days?
2. There are 63 gallons in a hogshead. Find the sum in gallons of $\frac{1}{7} + \frac{2}{7} + \frac{3}{7} + \frac{4}{7} + \frac{5}{7} + \frac{6}{7}$ of a hogshead.
3. Find the sum in rods of $\frac{3}{8} + \frac{5}{8} + \frac{7}{8}$ of a mile.
4. There are 144 square inches in a square foot. What is the sum in square inches of $\frac{5}{9}$ and $\frac{7}{9}$ of a square foot?
5. What is the sum of $\frac{2}{9}$, $\frac{4}{9}$ and $\frac{8}{9}$ of a sq. ft., expressed in square inches?
6. What is the sum in seconds of $\frac{1}{6}$, $\frac{4}{6}$ and $\frac{5}{6}$ of an hour?
7. What is the sum of $\frac{3}{7}$ and $\frac{5}{7}$ of \$680.49?
8. What is the sum in pounds of $\frac{1}{10}$, $\frac{3}{10}$, $\frac{7}{10}$ and $\frac{9}{10}$ of a ton?
9. What is the sum of $\frac{8}{11}$, $\frac{5}{11}$, $\frac{7}{11}$ and $\frac{9}{11}$ of 12 times \$22?
10. There are $12 \times 12 \times 12$ cubic inches in a cubic foot. What is the sum in cubic inches of $\frac{5}{12}$, $\frac{7}{12}$ and $\frac{11}{12}$ of a cubic foot?
11. What is the sum of $\frac{6}{7}$ of 42 gallons, $\frac{5}{9}$ of 45 gallons, and $\frac{7}{8}$ of 40 gallons of oil?
12. What is the sum of $\frac{1}{2}$ of 144 sq. in., $\frac{8}{9}$ of 144 sq. in., and $\frac{7}{8}$ of 144 sq. in.?
13. What is the sum of $\frac{2}{7}$ of \$21.56, $\frac{5}{7}$ of \$28.14, $\frac{2}{7}$ of \$84.21, and $\frac{6}{7}$ of \$140?
14. Some damaged goods that cost \$1200 sold for $\frac{5}{6}$ of the cost. What did they bring?
15. Flour that cost \$480 sold at an advance of $\frac{8}{9}$ of the cost. What did the flour sell for?
16. A's age is 27 years. B's age is A's age increased by $\frac{7}{9}$ of A's age. What is B's age?

LESSON XXIX.

	52	53	54	55	56	
1	2375	48281	6794575	8456786	786548489	32
2	8674	75839	4659768	7684538	875769829	33
3	4789	88672	5783684	8759687	757864568	38
4	4637	64868	5864889	8475978	576748689	1 84
5	8483	59873	4579395	6897528	846598554	47
6	7534	74858	8977878	7958785	946758765	85
7	5987	66946	5766964	5387649	597595889	48
8	7688	77585	8454846	7523463	884615721	36
9	3467	56786	8548569	4678569	578564877	49
10	7658	79579	6975675	7758868	853246938	87
11	6784	95788	5735487	8695448	698765884	88
12	8476	87859	7854876	6948597	798656448	2 39
13	7954	64878	8877869	7887638	674865786	50
14	4597	48786	9668877	8736837	536978321	40
15	9876	77854	6989876	5548876	856489554	41
16	6789	57487	6798984	9850438	987781763	51
17	9987	97569	7893968	6454824	859658489	
18	5681	54865	8759688	7587695	869869756	
19	6487	67547	9764678	9487685	456786784	
20	5984	78985	7946342	4895647	567865987	42
21	4679	74628	8976889	8376486	647856898	43
22	8578	59775	6589582	7898769	688478628	
23	5684	46587	8466889	5783349	745947848	
24	7563	68754	8593274	9328795	598689578	3 44
25	7689	86587	6788531	3896578	484696854	45
26	8458	54598	5864928	1296859	876774256	46
27	7547	65786	3656184	8635853	837788874	
28	6483	28485	8877888	6887869	586976488	
29	9575	85627	5884298	7687574	874672175	
30	6481	59878	8676936	9784658	868988914	
31	7865	67896	5876885	7888945	874856387	

In using this table from 1 to 31 inclusive, find the sum of the horizontal numbers. From 32 to 51 inclusive, find the sum of the vertical numbers within the respective braces. From 52 to 56 inclusive, find the sum of the page columns.

LESSON XXX.

SUBTRACTION.

1. The terms used in *Subtraction* are *Minuend*, *Subtrahend* and *Difference*.

2. The *Minuend* is the greater of the two numbers given; the *Subtrahend* is the smaller.

3. The minuend less subtrahend is the *Difference*. The difference may be found by either of two ways, by diminishing the minuend by the subtrahend, or by increasing the subtrahend to the minuend. To illustrate: What is the difference between 19 and 25? We may say 25 less 19 equals 6, *the difference*; or, we may say 19 and 6 are 25, when 6 is just as truly *the difference*. In either case, it will be seen that addition is the one process that is *fundamental*.

4. The minuend is the whole of which the subtrahend and difference are the parts.

5. When the question is of such a nature as to require the part given (subtrahend) to be taken out of the whole (minuend) what is left is sometimes called the *Remainder*.

6. Proof: Observe that the subtrahend plus difference *must* equal the minuend.

7. How many years must be added to 1885 to complete the present century? What is the minuend? subtrahend? difference?

8. What is the difference between seven 7's and nine 9's? What is the minuend? subtrahend? difference?

9. A man who owed \$5000 on his house and lot has made 8 payments of \$1000 each. How much does he still owe? Give the minuend, subtrahend and difference.

10. What number is 149 less than 1000? Is 149 the subtrahend or difference?

LESSON XXXI.

	1.	2.	3.	4.
Subtrahend,	125	850	475	641
Difference,				
Minuend,	1000	1000	1000	1000
	5.	6.	7.	8.
Sub.,				
Dif.,	950	1050	1268	1492
Min.,	2000	2000	2000	2000
	9.	10.	11.	12.
Min.,	\$185.41	\$150.75	\$1000.00	\$2000.00
Sub.,	46.19	125.76	100.25	1000.10
Dif.,				
	13.	14.	15.	16.
Min.,	\$1241.05	9675 lbs.	\$150.00	118450 mi.
Sub.,				
Dif.,	\$ 800.50	2857 lbs.	\$ 19.25	84844 mi.
	17.	18.	19.	20.
From	45009	174620	723608	800000
Subtract	18091	90818	518019	876455
	21.	22.	23.	24.
From	700060	600460	846571	919645
Subtract	508116	278487	184688	820756
	25.	26.	27.	28.
From	\$19.065	\$20.000	\$200.00	\$5000.00
Subtract	9.146	10.075	100.87	8050.25

LESSON XXXII.

1. What number must be added to 6788 to make 9000?
2. What number must be taken out of 12000 to leave a remainder of 5629?
3. What number is 1848 less than 2500?
4. What number is greater by 568 than 496?
5. The sum of two numbers is 100000, one of them is 50005. What is the other?
6. A man owed \$427.50. He paid at one time \$125.75, at another \$100, and at another \$50.25. What remained unpaid?
7. A grain dealer bought 5075 bu. of wheat at one time, and 12300 bu. at another. He sold 8763 bu. to one customer, and 4000 bu. to another. How many bushels had he left?
8. A man having \$12470 paid \$4070 for a house, \$927 for furniture, and \$1000 for improvements. How much money had he left?
9. Gave \$150 for a horse, \$175.84 for a carriage, and \$62.50 for a harness, and sold the whole for \$390.50. What was the gain?
10. A man bought four city lots for which he paid \$15760. For the first he paid \$2175, for the second \$8794, and for the third \$4587. How much did he pay for the fourth?
11. A speculator gained \$5760, and afterward lost \$2746; at another time he gained \$8575, and then lost \$4832. How much did his gains exceed his losses?
12. Three men bought a hotel valued at \$35680. The first agreed to pay \$7875, the second twice as much, and the third the remainder. What was the third to pay?
13. A had 450 sheep, B had 175 more than A, and C had as many as A and B together minus 114. How many sheep had C?

LESSON XXXIII.

1. How much greater is three hundred thousand five than sixteen thousand ninety?
2. What is the difference in minutes between 21 days 12 hours long, and 25 days 10 hours long?
3. Subtract 9119 from 118018.
4. The subtrahend is 260846, and the remainder 72304. What is the minuend?
5. The difference is \$810.62, and the minuend \$1206.28. What is the subtrahend?
6. What is the sum of 4062 and 12856 increased by the difference between 15000 and 975?
7. From the sum of 28462 and 9030, subtract the difference between 84000 and 7640.
8. From the difference between 19876 and 6032, subtract the difference between 12000 and 678.
9. From what sum must \$.62 be taken to leave a remainder of \$14.60?
10. From 8741 subtract 8917.
11. How many more than 97865 is 185964?
12. 1012130 less 808856 equals what?
13. How many are 15000 hours less 8750 hours?
14. From \$1.25 take 6 cents and nine mills.
15. How much does 56173 exceed 17485?
16. In selling a quantity of flour for \$7265, there was realized a profit of \$1575. What was the purchase price of the flour?
17. In selling coal for \$1950, \$175 was made. What would have been made had the coal sold for \$2176?
18. A man bought two farms, one of 136 acres at \$28 an acre, and another of 140 acres at \$33 an acre; he paid at one time \$4000, and at another time \$1875. How much remained unpaid?

LESSON XXXIV.

1. The population of Chicago in 1880 was 491516, in 1884 628985. What was the increase in 4 years?

2. The population of Chicago in 1870 was 806605, in 1880 491516. At the same rate of increase what will be the population of Chicago in 1890? In 2000?

3. By the school census of 1884, the total population of the South Division of Chicago was 149564; of the North Division 128190, and of the West Division, 351981. By how much does the population of the West Division exceed the united population of the North and South Divisions?

4. The coal product of the United States in 1884 is estimated to have been worth \$191666147. The anthracite of Pennsylvania alone was worth \$61436586. What was the value of the coal product of the other States combined?

5. The production of gold and silver in the United States in 1884 amounted to a total value of \$79600000. The value of the silver was \$48800000. By how much did the silver exceed the gold?

6. The highest land elevation of Asia is 29000 ft., of Europe is 18500 ft. What is the difference?

7. Chimborazo, S. A., is 20517 ft. high; Mount St. Elias, N. A., is 17900 ft. high. How much higher is Chimborazo than St. Elias?

8. The area of the Caspian Sea is 182000 sq. mi.; of Lake Superior, 31400 sq. mi.; of Lake Michigan, 25600 sq. mi.; of Lake Huron, 28800 sq. mi.; of Lake Erie, 10000 sq. mi.; of Lake Ontario, 7900 sq. mi. How much larger is the Caspian Sea than the Great Lakes combined?

9. The highest point of land in S. A. is 23421 ft.; in N. A. 17900 ft. What is the difference between the two highest points of Asia and Europe united and of North and South America united?

LESSON XXXV.

How many years have elapsed since the date of the following events :

1. Battle of Bunker Hill, 1775.
2. The first bank established in Italy in 808.
3. Anthracite coal first used for fuel in 1768.
4. Great earthquake at Lisbon, 1755.
5. Joseph sold as a slave into Egypt, B. C. 1728.
6. Fugitive slave law in the United States, 1850.
7. Gas-lights first used in London, 1807.
8. King Philip's War, 1675.
9. Magna Charta, 1215.
10. First newspaper in America, 1704.

1. Express in rods 1 mile less $\frac{3}{4}$ of a mile.
2. Express in quarts 1 bushel less $\frac{5}{8}$ of a bushel.
3. What sum of money is less than \$600 by $\frac{5}{2}$ of it?
4. What is the difference between $\frac{5}{8}$ of 160 acres and $\frac{3}{4}$ of 210 acres?
5. From $\frac{5}{9}$ of \$5400 take $\frac{7}{9}$ of \$3600.
6. Flour that cost \$5600 was sold for $\frac{7}{8}$ of the cost. What was the selling price?
7. A's age is $\frac{7}{10}$ of the age of B, whose age is 8 score years and 10. What is A's age?
8. $\frac{7}{11}$ of \$18200 is \$300 more than was paid for a farm. What was the price paid for the farm?
9. Express in rods the difference between $\frac{5}{8}$ of a mile and $\frac{3}{5}$ of a mile?
10. Express in square inches the difference between $\frac{11}{12}$ and $\frac{5}{6}$ of a square foot.

LESSON XXXVI.

The following table will furnish a very extended practice by finding the difference between any two numbers. For instance: Find difference between Ex. 4, Col. A and Ex. 6, Col. B, etc.

	Col. A.	Col. B.	Col. C.	Col. D.	Col. E.
1	8467	59878	854856	64596897	678655488
2	6784	79579	875968	73878568	859658489
3	8192	74985	859827	94376482	689364887
4	5788	96587	176486	12987869	874672175
5	9005	57004	780868	48958748	485895689
6	8947	86785	597089	69784652	674578464
7	5604	78007	887788	50806530	860087088
8	7039	80834	900402	74057876	981268588
9	6409	73040	860547	59704697	745947853
10	9046	53886	782000	80370702	607058487
11	7804	74648	859807	12875784	804926578
12	8978	50704	740684	61048215	217659784
13	7605	86880	827048	37610123	796021482
14	5078	90448	800422	15489348	390567498
15	9094	46794	657387	53894563	578556876
16	5468	54088	598453	75230706	867782648
17	8005	62708	647826	94673210	743794485
18	8796	54396	539473	58948988	48765327
19	7689	85681	946936	28459876	568778465
20	4794	78920	673984	98762513	876738564
21	5793	65784	573086	56864284	629315873
22	4385	54598	659983	73568365	548732468
23	6982	67854	764865	90080040	876621743
24	9361	18456	849580	53607921	439864328
25	6788	82147	603200	85686548	580804288
26	1298	41326	900804	24317674	394165708
27	5463	85678	582060	50804708	436487487
28	7175	54794	758174	29658562	676493678
29	5487	65782	591826	65590087	500800600
30	8672	80664	807147	90000550	734566788

LESSON XXXVII.

MULTIPLICATION.

1. The **Terms** used in **Multiplication** are **Multiplicand**, **Multiplier**, and **Product**.

2. The multiplicand and multiplier are the **Factors** of the product. When multiplied together they produce the product.

3. The operation of multiplication consists in multiplying the multiplicand by the multiplier, or, in multiplying the factors together.

4. The sign of multiplication is **X**. When used it should be written after the the multiplicand, and read multiplied by. \$18 \times 36 is read \$18 multiplied by 36, or 36 times \$18.

5. PROOF.—The best proof is accuracy, always accuracy. When pupils have learned division, they may be required to divide their product by the multiplier.

1. What will 75 acres of land cost at \$125 an acre?

2. What will 325 horses cost at \$175 each?

3. At \$37.50 each, what will 320 cows cost?

4. Multiply \$420.25 by 305.

5. Multiply \$27.70 by 76.

6. What cost 100 tons of coal at \$6.75 a ton?

7. A barrel of flour weighs 196 lbs. How much do 48 bbls. of flour weigh? What is the multiplicand? The multiplier? In the operation, is the multiplier 48 bbls. or 48? What is the product? How would the example be wrought by addition? Which operation is the shorter, by multiplication or addition? Is the product *pounds* or *barrels*? What is the product always like?

8. Cost of 130 sheep at \$4.80 a head?

9. Cost of 150 bbls. of flour at \$6.25 per bbl.?

10. Cost of 338 bbls. of pork at \$11.25 a bbl.?

LESSON XXXVIII.

1. What will 56 acres of land cost at \$164.50 an acre?
2. What number must be added to 272×400 to make the amount 126720?
3. At 28 cents a pound, what will be the cost of 24 sacks of coffee, each containing 64 pounds?
4. What is the value of 107 pieces of cloth, each piece containing 42 yards, at \$4.28 a yard?
5. How many yards of shirting in 49 bales, each bale containing 26 pieces, and each piece 57 yards?
6. What is the cost of 128 barrels of beef, each containing 216 pounds, worth 18 cents a pound?
7. Paid \$2709 for 388 barrels of flour, and sold the same at \$9.12 a barrel. How much was the gain?
8. What is the difference in the cost of 48 horses at \$142.50 each, and of 180 sheep at \$4.80 a head?
9. If a man has an income of \$5670 a year and his daily expenses average \$7.25, how much can he save in a year of 365 days?
10. If a clerk receives \$1500 salary, and pays \$870 for board, \$281.50 for clothing, \$112.90 for books, and \$196.65 for other expenses annually, what can he save in 8 years?
11. A merchant bought 7 hogsheads of sugar at \$46.45 a hogshead, and sold it for \$53.62 a hogshead. How much did he gain?
12. A man owing \$15760, gave in payment 5 lots of land worth \$780 each, 5 horses valued at \$286.50 each, an interest he had in a coal mine worth \$2000, and \$1728.75 in money. How much remained unpaid?
13. A farm house is worth \$8246, the farm is worth 3 times as much plus \$1200, and the stock is worth twice as much as the house, less \$1875. What is the value of the whole, and of the farm and stock?

LESSON XXXIX.

1. Find the cost of 886 railway coaches at \$7084.75 each.
2. What cost 802 tubs of butter at \$27.08 each?
3. What will be the cost of building a line of telegraph 274 miles long at \$967 a mile?
4. If 1049 pounds of seed cotton be raised from an acre of land, how many pounds will 386 acres produce?
5. If a cotton mill manufactures 628 yards of cloth in a day, how many yards can it make in 297 days?
6. If a garrison of soldiers consume 5789 pounds of bread a day, how much will they consume in 237 days?
7. How many oranges in 356 boxes, each box containing 264 oranges?
8. Three schooners ship 289 cords of wood each, and a fourth ships 248 cords. What is the value of the whole at \$4.25 a cord?
9. If it requires 108 tons of iron rail for 1 mile of track, how many tons will be required for 476 miles, and what will be its value at \$145 a ton?
10. A crop of cotton was put up in 472 bales, the average weight of which was 588 pounds. What was the weight of the whole crop and its value at 18 cents a pound?

What is the product:

11. Of 2572 bushels by 91?
12. Of \$403.06 by 127?
13. Of 86072 pounds by 208?
14. Of 316 times \$487.46?
15. Of 507 times 30975 days?
16. Of 325 times 6408 cents?
17. Of 870607 by 4971?
18. Of 600826 by 2645?
19. Of 780096 by 5006?
20. Of 2407068 by 8406?
21. Of 408091 by 2407?
22. Of 73069 by 46085?
23. Of \$4.72 by 100?
24. Of \$80.40 by 60?
25. Of \$1200 by 700?
26. Of 42080090 \times 8020?
27. Of 120 times 5000?
28. Of 600 times 21000?
29. Of 1000 times 104000?
30. Of 7000600 \times 50040?

LESSON XL.

1. The factors are 4576 and 289. What is the product?
2. What is the product of the factors 31, 41 and 51?
3. How many acres are there in 225 farms of 225 acres each?
4. What will 75 tubs of maple sugar cost, each tub containing 75 lbs., at \$0.15 a pound?
5. A capitalist bought 5 farms: One of 206 acres, at \$69 per acre; one of 289 acres at \$58 per acre; one of 887 acres at \$75 per acre; one of 868 acres at \$87 per acre, and one of 416 acres at \$98 per acre. After paying \$125000 how much did he owe?
6. How many feet are there in 569 miles?
7. If two ships start from the same port and sail in opposite directions, one 69 miles a day and the other 78 miles a day, how far apart will they be after sailing 29 days?
8. Two ships sail from distant ports and sail toward each other at the rate of 68 and 78 miles a day respectively. They meet at the close of the 19th day. How far apart were they at starting?
9. A farm of 176 acres was bought for \$59 an acre; it was sold at an advance of \$18 an acre. What was the gain and what did the farm sell for?
10. A merchant bought a quantity of flour for \$6789. He sold it at an advance of $\frac{1}{3}$ of the cost less \$467. What was the gain and what was the selling price?
11. A merchant bought 500 bbls. of flour at \$4.75 a bbl. He sold 116 bbls. for \$4.87 $\frac{1}{2}$ a bbl., 125 bbls. for \$5.25 a bbl., and the remainder for \$5.68 a bbl. What was the entire gain?
12. What will be the cost of 5 bales of cloth, each bale containing 15 pieces, and each piece measuring 26 yards, at \$1.75 a yard?

LESSON XLI.

ALIQUOT PARTS OF ONE DOLLAR.

$$\begin{array}{l} 5 \text{ cents} = \frac{1}{20} \text{ of } \$1. \\ 10 \text{ cents} = \frac{1}{10} \text{ of } \$1. \\ 20 \text{ cents} = \frac{1}{5} \text{ of } \$1. \\ 25 \text{ cents} = \frac{1}{4} \text{ of } \$1. \\ 50 \text{ cents} = \frac{1}{2} \text{ of } \$1. \end{array}$$

$$\begin{array}{l} 6\frac{1}{4} \text{ cents} = \frac{1}{16} \text{ of } \$1. \\ 8\frac{1}{3} \text{ cents} = \frac{1}{12} \text{ of } \$1. \\ 12\frac{1}{2} \text{ cents} = \frac{1}{8} \text{ of } \$1. \\ 16\frac{2}{3} \text{ cents} = \frac{1}{6} \text{ of } \$1. \\ 33\frac{1}{3} \text{ cents} = \frac{1}{3} \text{ of } \$1. \end{array}$$

1. At $6\frac{1}{4}$ cents a lb. for sugar, how many lbs. can be bought for \$1?
2. What will 48 oranges cost at $6\frac{1}{4}$ cents each?
3. At $8\frac{1}{3}$ cents each, how many copy books can be bought for \$1?
4. Cost of 5 dozen copy books at $8\frac{1}{3}$ cents each?
5. At $12\frac{1}{2}$ cents a lb. for maple sugar, how many lbs. will \$1 buy?
6. Cost of a tub of maple sugar, weighing 72 lbs. net, at $12\frac{1}{2}$ cents a lb.?
7. At $16\frac{2}{3}$ cents a dozen for eggs, how many eggs can you buy for \$1?
8. What will 96 yards of ribbon cost at $16\frac{2}{3}$ cents a yard?
9. At $33\frac{1}{3}$ cents a lb. for coffee, how many lbs. can you buy for \$1? \$2? \$3? \$7? \$25?
10. At $33\frac{1}{3}$ cents a bu. for oats, what will 33 bu. cost? 42 bu.? 420 bu.?
11. At $6\frac{1}{4}$ cents each for drawing pencils, how many can be bought for \$48?

ANALYSIS. At $6\frac{1}{4}$ cents a piece \$1 will buy 16 pencils. Then \$48 will buy 48 times 16 pencils.

12. At $12\frac{1}{2}$ cents a yard how many yards of calico will 27 lbs. of butter at $33\frac{1}{3}$ cents a lb. pay for?
13. Cost of 160 lbs. of sugar at $6\frac{1}{4}$ cents a lb.? at $8\frac{1}{3}$ cents? at $12\frac{1}{2}$ cents?

LESSON XLII.

1. A **Debt** is that which is due from one person to another, whether money, goods, or service.
2. A **Debtor** is a person who owes another either money, goods, or service.
3. A **Creditor** is one to whom the money, merchandise, or service is due.
4. A **Bill** is an account of goods sold or service rendered with the price annexed to each item.
5. The letter @ in bills means "at," and is followed by the price of *one* of the things named in the item.
6. To *extend* a bill is to find the price of the several quantities itemized.
7. To *foot* a bill is to add the extended column.
8. To *receipt* a bill is to write "Paid" or "Received Payment" at the bottom of the bill together with the name of the Creditor.

NOTE.—Bills are usually receipted by the Cashier. Any Clerk authorized to receive money may receipt a bill.

9. CHICAGO, May 6, 1885.
MRS. AYERS, No. 2000 Dearborn Avenue,
Bought of M. A. SWIFT & CO.

May,	5	1 Umbrella,	\$ 1 00
		1 Skirt,	1 75
		9 Yds. Cashmere, @ 40 cts.	3 60
		4½ Yds. Ribbon, @ 20 cts.	90
		4 Vests, @ \$1.25,	5 00
			\$ 12 25

This bill was settled on June 1. The Cashier received the money and wrote at the bottom of the bill a receipt, as follows:

Paid June 1.

M. A. SWIFT & CO.

By H. J.

LESSON XLIII.

CHICAGO, Aug. 7, 1885.

MR. J. S. MILLS, Aurora, Ill.,

Bo't of LEONARD BACON & Co.

Aug.	15	12 yds. Broadcloth,	@ \$2.25	\$27	00
	18	" Cassimere,	" 1.75	31	50
	10	" Satinet,	" 1.12 $\frac{1}{2}$	11	25
	42	" Flannel,	" .50	21	00
	35	" Silk,	" 1.18	41	30
					\$132 05

Received Payment, Sept. 1.

LEONARD BACON & Co.

By A. H. S.

Make out bills, extend, foot, and receipt, the first of the month following the purchase:

1.	8 lbs. Ham,	@ \$.16
	12 lbs. Veal,	" .16
	16 lbs. Mutton,	" .18
	11 lbs. Beef,	" .22
	12 lbs. Pork,	" .8 $\frac{1}{2}$
2.	10 Hams, 18 lbs.,	" .17
	10 Dried Beef, 18 lbs.,	" .18
	25 lbs. Codfish,	" .11
	16 lbs. Mackerel,	" .6 $\frac{1}{2}$
	16 lbs. Bacon,	" .12 $\frac{1}{2}$
3.	36 yds. Calico,	" .8 $\frac{1}{2}$
	64 Spools Thread,	" .6 $\frac{1}{4}$
	75 yds. Sheeting,	" .18
	48 yds. Cassimere,	" \$2.25
	4 Table-cloths,	" 1.85

4.	112 bbls. Flour,	@ \$5.75
	108 tons Hay,	" 18.
	225 bu. Wheat,	" .92
	417 bu. Corn,	" .88 $\frac{1}{2}$
	130 bu. Barley,	" .88
	75 bu. Rye,	" .94
5.	12 doz. Eggs,	" 12 $\frac{1}{2}$
	12 doz. Eggs,	" 16 $\frac{2}{3}$
	48 lbs. Coffee,	" 38 $\frac{1}{3}$
	15 lbs. Butter,	" .25
	32 lbs. Cheese,	" .6 $\frac{1}{4}$

6.

Sept.	3	To 5 Blank Books,	@ \$2.30		
"	"	" 7 gross Spencerian Pens,	" 1.12		
"	26	" 15 B. & S. Bookkeeping,	" 1.75		
Oct.	10	" 4 reams Cap Paper,	" 3.40		
"	19	" 20 Townsend's Com. Law,	" 2.87		
Nov.	22	" 12 packs Plain Cards,	" .37		
Dec.	4	" Note Paper and Ink,		2	78
					\$

Received Payment by note at 30 days, Jan. 2, 1885.

7.

	15 yds Broadcloth,	@ \$4.20		
	24 " Satinet,	" 1.37 $\frac{1}{2}$		
	10 " Vesting,	" .90		
	42 " Flannel,	" .75		
	60 " Drilling,	" .16		
	12 " Silk,	" 2.62 $\frac{1}{2}$		
	38 " Ticking,	" .52		

8.

Jan.	6	For Building Barn, as per contract, . . .	\$450
"	"	Extra Labor,	40 75
Mch.	20	" 15 days' work of self, @ \$3½	
"	"	" 7 " " of son,	1.50
April	16	" 2 " "	3.50
"	"	Nails, Hinges and Sundries,	150
			\$

LESSON XLIV.

1. Make a bill of the books and stationery used in the Fourth Grade.
2. Make a bill of 7 items bought of your grocer, amounting to not less than \$5. Let the items be appropriate in quantity and price.
3. Make a bill of 7 items bought at a retail dry goods store. Let the goods be bought on three consecutive Saturdays. Amount of bill not less than \$10.
4. Make a bill of 5 items bought at a flour and feed store. Buy at wholesale. Bill to amount to \$1000. Consult commercial column of daily paper for current prices.
5. Make a bill of 5 items bought at a retail hardware store—\$25.
6. Make a bill of 7 items bought on South Water street. Consult daily paper for prices.
7. Make a bill of \$7000 bought at a wholesale grocery house. Let the quantity of the items be well considered. Consult daily paper for prices—10 items.
8. Make a bill for a set of crockery sufficient for housekeeping. The amount of bill may vary from \$25 to \$150.
9. Make a bill for 10 different books you would like to own. Let the prices be current. Let the purchases be made on four consecutive Saturdays.

LESSON XLV.

MISCELLANEOUS.

1. How much heavier is $\frac{1}{4}$ of a pound of gold than $\frac{2}{3}$ of a pound?
2. How much less is $\frac{5}{8}$ of a day than $\frac{2}{3}$ of a day?
3. How much less is $\frac{3}{5}$ of a pound of coffee than $\frac{3}{4}$ of a pound?
4. How much greater is $\frac{5}{9}$ of a hogshead of wine than $\frac{2}{3}$ of it?
5. How many times $\frac{1}{9}$ of a hogshead of molasses is $\frac{5}{9}$ of it?
6. How much less is $\frac{2}{9}$ of a square yard of carpet than $\frac{2}{3}$ of it?
7. Out of $\frac{5}{8}$ of a peck of oats $\frac{1}{8}$ of a peck was taken. How many quarts were left?
8. How many times $\frac{2}{4}$ of a peck of corn are 6 bushels?
9. How many times are $\frac{5}{8}$ of a peck in 5 pecks?
10. What is the weight of 5 gold rings, each weighing $\frac{3}{5}$ of an ounce?
11. $\frac{3}{4}$ of an ounce of gold is how much greater than $\frac{2}{3}$ of it?
12. $\frac{3}{4}$ of a pound of tea is how much greater than $\frac{5}{8}$ of it?
13. $\frac{7}{12}$ of an hour is how much less than $\frac{3}{5}$ of it?
14. 49 months are how many times $\frac{7}{12}$ of a year?
15. $\frac{4}{5}$ of a ton of hay is how many times $\frac{1}{10}$ of a ton?
16. How much time elapses from 9 o'clock A. M. to 12 M.?
17. How much time elapses from 10 o'clock A. M. to 3 P. M.?
18. How much time is from 9-30 o'clock A. M. to 2-30 P. M.?
19. How much time is from 9-40 o'clock A. M. to 2-20 P. M.?
20. How much greater is the time from 10-15 A. M. to 2 45 P. M., than from 10-45 A. M. to 2-15 P. M.?
21. What is the time from 2-30 P. M. Monday, to 9-15 A. M. Tuesday?

LESSON XLVI.

SQUARE MEASURE.

1 square mile = 640 acres.	144 square inches = 1 sq. foot.
1 acre = 160 square rods.	9 square feet = 1 sq. yard.
1 square rod = $30\frac{1}{4}$ sq. yards.	$80\frac{1}{4}$ sq. yards = 1 sq. rod.
1 square yard = 9 square feet.	160 square rods = 1 acre.
1 square foot = 144 sq. inches.	640 acres = 1 square mile.

1. 3 square yards equal how many square feet?
2. 54 square feet equal how many square yards? 72 square feet?
3. $\frac{1}{2}$ of a square foot equals how many square inches?
4. $\frac{1}{2}$ acre equals how many square rods? $\frac{1}{8}$ acre?
5. $\frac{1}{4}$ of an acre equals how many square rods?
6. $\frac{5}{8}$ of an acre equals how many square rods?
7. 12 square inches equal what part of a square foot?
8. 8 square feet equal what part of 2 square yards?
9. 8 square feet equal $\frac{1}{9}$ of how many square yards?
10. $\frac{3}{8}$ of a square mile equals how many acres?
11. $\frac{7}{10}$ of a square mile equals how many acres?
12. 6 square feet equals what part of 4 square yards?
13. 1 square yard equals what part of 45 square feet?
14. 40 square rods equal $\frac{1}{4}$ of how many acres?
15. 9 square yards 10 square feet equal how many square feet?
16. 12 square feet equal $\frac{1}{3}$ of how many square yards?
17. How much greater is 5 square yards than 36 square feet?
18. How much less is $\frac{1}{12}$ of a square foot than 20 square inches?
19. 115 square feet equal how many square yards?

LESSON XLVII.

CUBIC MEASURE.

1 Cord=128 Cubic Feet.	1728 Cubic Inches=1 Cu. Ft.
1 Cubic Yard=27 Cubic Feet.	27 Cu. Ft.=1 Cubic Yard.
1 Cubic Ft.=1728 Cu. Inches.	128 Cu. Ft.=1 Cord.

1. 2 cubic yards 6 cubic feet equal how many cubic feet?
2. $\frac{1}{3}$ of a cubic yard equals how many cubic feet? $\frac{2}{3}$?
3. $\frac{1}{9}$ of a cubic yard equals how many cubic feet? $\frac{5}{9}$?
4. $\frac{4}{9}$ of a cubic yard is how much greater than $\frac{1}{3}$ of a cubic yard?
5. 6 cubic feet is what part of 2 cubic yards? 9 cubic feet?
6. 9 cubic feet is $\frac{1}{3}$ of how many cubic yards? 8 cubic feet?
7. $\frac{1}{4}$ of a cord equals how many cubic feet?
8. $\frac{1}{6}$ of a cord equals how many cubic feet?
9. A cord is a pile of wood 8 feet long, 4 feet wide and 4 feet high. What part of a cord is in 4 feet of the same pile?

AREAS.

The amount of surface in figures like the following



is called the *Area*. Area is always expressed in sq. in., sq. ft., sq. yd., sq. rd., etc., and is equal to the product of the length of the surface multiplied by the width, as: the area of a slate 12 inches long and 8 inches wide is 96 square inches.

1. What is the area of a slate 9 inches long and 6 in. wide?
2. What is the area of a table 8 feet long and 4 feet wide?
3. What is the area of a floor 6 yards long and 5 yards wide?
4. What is the area of a garden 12 rods long and 9 rods wide?
5. How many square feet are in a board 12 feet long and 12 inches wide?

LESSON XLVIII.

1. What is the area of one side of a slate 12 inches long and 7 inches wide?
2. What is the area of one side of a leaf of writing paper 9 inches long and 8 inches wide?
3. A blackboard is 12 feet long and 4 feet wide. What is its area?
4. How many square yards equal the ceiling of a room 8 yards long and 5 yards wide?
5. How many square yards equal a blackboard 9 feet long and 5 feet wide?
6. How many square feet in a surface 12 inches long and 12 inches wide?
7. What is the area of a field 12 rods long and 8 rods wide?
8. A field 10 rods long contains 80 square rods. How wide is it?
9. A blackboard whose area is 24 square feet is 8 feet wide. How long is it?
10. What part of a square foot is a surface 4 inches long and 8 inches wide?
11. What part of a square yard is a surface 2 feet long and 2 feet wide?
12. At 8 cents a square foot what is the cost of making a blackboard 4 feet long and 8 feet wide?
13. At 9 cents a square inch what is the cost of finishing a binding 3 inches long and 8 inches wide?
14. At \$1 a square yard what is the cost of painting the ceiling of a room 4 yards long and 3 yards wide?
15. At 9 cents a square yard what is the cost of painting a floor 9 feet wide and 12 feet long?
16. What part of an acre does a field contain that is 10 rods long and 8 rods wide?

LESSON XLIX.

REDUCTION BY MULTIPLICATION.

1. How many inches in 26 rd., 3 yd., 2 ft., 9 in.?
2. How many feet in 7 fur., 80 rd., 4 yd.?
3. How many pints in 6 bu., 3 pk., 6 qt.?
4. How many pennyweights in 4 lb., 9 oz., 12 pwt.?
5. How many quarts in 2 hhd., 24 gal., 3 qt.?
6. How many minutes in 4 wk., 8 da., 5 hr.?
7. How many square inches in 14 sq. yd., 5 sq. ft.?
8. How many cubic inches in 5 cu. yd.?
9. How many pounds in 4 T., 12 cwt., 60 lb.?
10. How many ounces in 6 cwt., 28 lb., 10 oz.?
11. Reduce 3 mi., 226 rd. to feet.
12. Reduce 4 cwt., 10 lb. to ounces.
13. Reduce 10 lb., 10 oz. to pennyweights.
14. Reduce 25 gal., 1 qt. to pints.
15. Reduce 50 bu., 3 pk. to quarts.
16. Reduce 25 cords to cubic feet.
17. Reduce the month of August to minutes.
18. Reduce 14 A. to square rods.
19. Reduce 10 sq. mi. to acres.
20. Reduce 40 rd., 5 yd. to feet.
21. Change 25 mi. to feet.
22. Change 50 bu. of wheat to pounds.
23. Change 4 perches of stone to cubic inches.
24. Change 40 T. to pounds.
25. Change 100 acres to square rods.
26. Change 25 hhd. to gallons.
27. Change 25 bbls. of flour to pounds.
28. Change 80 bu. of oats to pounds.

LESSON L.

1. A pile of wood 8 ft. long, 4 ft. wide and 4 ft. high contains a cord. How many cubic feet in a cord?
2. How many cords are there in a pile of wood 24 ft. long, 4 ft. wide and 4 ft. high?
3. How many cords of wood in 5 piles, each pile being 48 ft. long, 8 ft. high and 4 ft. wide?
4. There is a shed 32 ft. long, 20 ft. wide and 12 ft. high. Find the value of the wood that can be piled in the shed when wood sells at \$15 a cord.
5. How many square feet are there in a board that is 15 ft. long and 12 in. wide?
6. How many square feet of floor would 12 such boards make?
7. There is a blackboard 36 ft. long and 3 ft. wide. How many square yards of surface does the board measure?
8. How many square yards of surface in 12 such boards?
9. How many square yards of ceiling in a room 18 ft. long by 15 ft. wide?
10. How many yards of carpet a yard wide would be required for the floor of a hall 60 ft. long by 42 ft. wide?
11. What would the carpet cost at 85 cts. a yard?
12. How many square yards of surface will one side of a room 21 ft. long and 15 ft. high measure? 2 sides?
13. If the room is 18 ft. wide what would the other two wall surfaces measure?
14. How many plastered surfaces are there in your school room? Name them.
15. How many square rods in a field 90 rods long and 75 rods wide? How many acres?
16. How much will it cost to dig a cellar 24 feet long, 18 feet wide, and 6 feet deep, at 1 cent a cubic foot?
17. How many square feet in 1 acre?

LESSON LI.

DIVISION.

1. The terms used in division are **Dividend**, **Divisor**, **Quotient** and **Remainder**.

2. We divide the *dividend* by the *divisor* to obtain the *quotient*.

3. When the dividend is something more than the product of the divisor and quotient, the part in excess of such product is called *remainder*. The remainder is an undivided part of the dividend.

4. **Proof.**—Multiply quotient by divisor. If there be no remainder, the product should equal the dividend. If there be a remainder, it must be added to such product to get the dividend.

5. The sign of division is made thus: \div . It is read: *divided by* or *divided into*.

6. An operation of division may be expressed in three ways. Let it be required to divide 480 bbls. of flour into 16 equal lots. The operation may be expressed thus:

480 bbls. \div 16 = ? or thus: 16)480 bbls.
or by writing the dividend over the divisor, thus: $\frac{480}{16}$

The first expression makes with the answer an equation, and should be used when the quotient can be written at sight.

The second expression is the usual one when the several steps in the operation are necessarily written out.

The third is the fractional form, and should be used when the operation can be shortened by cancellation.

$$\begin{array}{rcl} 7. \quad 4000 \div 20 = & \$ 2500 \div 50 = \\ 6000 \div 300 = & \$ 18000 \div 9 = \\ 12000 \div 4000 = & \$ 8100 \div 900 = \end{array}$$

$$8. \quad 26)3828 \qquad \qquad 27)12555 \qquad \qquad 28)16128$$

$$9. \quad \frac{8 \times 9}{8 \times 8} = \quad \frac{12 \times 12}{11 \times 12} = \quad \frac{26 \times 15}{13 \times 9} =$$

10. How many times is 29 contained in 68468?

OPERATION:

$$\begin{array}{r} 2360 \\ 29) 68468 \\ \underline{58} \\ 104 \\ \underline{87} \\ 176 \\ \underline{174} \\ 28 \end{array}$$

SUGGESTION:

By inspecting the operation, it will be seen that the last partial dividend is 28; one less than the divisor. 28 is the *remainder*.

PROOF. $2360 \times 29 = 68440$.

$$68440 + 28 = 68468.$$

LESSON LII.

1. How long can 60 men subsist on an amount of food that will last 1 man 7620 days?
2. How many tons of hay at \$26 a ton must be given for 24 cows worth \$32 a head?
3. How many casks, each holding 81 gallons, can be filled from 14 pipes of wine, each containing 124 gallons?
4. Bought 150 acres of land for \$7650, and sold it for \$63 an acre. How much was the whole gain?
5. What number divided by 95 will give a quotient of 75, and a remainder of 47?
6. How long would it take a train of cars, going at an average rate of 40 miles an hour, to travel around the earth at the equator, the distance being 24898 miles?
7. If 100 barrels of flour cost \$600, what will 350 barrels cost at the same rate?
8. How many bales, each weighing 510 pounds, can be *made of* 76500 pounds of cotton?

LESSON LIII.

1. The product of two numbers is 8928, and one of the numbers is 72; what is the other number?
2. The dividend is 7280, and the quotient is 208; what is the divisor?
3. A man sold 6 horses at \$125 each, 25 head of cattle at \$30 each, and with the proceeds bought land at \$25 an acre; how many acres did he buy?
4. How many pounds of cheese, worth 10 cents a pound, can be bought for 22 pounds of butter, worth 15 cents a pound?
5. If 56 yards of cloth cost \$386, how much will 12 yards cost at the same rate?
6. If I buy 225 barrels of flour for \$2025, and sell the same for \$1800, how much do I lose on each barrel?
7. A man sold his house and lot for \$5670 and took his pay in bank stock at \$90 a share; how many shares did he receive?
8. How many pounds of tea, worth 75 cents a pound, ought a man to receive in exchange for 27 bushels of oats, worth 50 cents a bushel?
9. The quotient of one number divided by another is 40, the divisor is 364, and the remainder 120; what is the dividend?
10. How many tons of hay at \$12 a ton, must be given for 21 cows at \$24 apiece?
11. A tobacconist has 6324 pounds of tobacco, which he wishes to pack in boxes containing 62 pounds each; how many boxes must he procure to contain it?
12. How many horses at \$260 each, can be bought for \$19500?
13. A drover received \$26460 for 196 head of cattle. How much was their average value a head?
14. If 48776 pounds of cotton be packed in 96 bales, what is the average weight of each bale?

LESSON LIV.

1. In 94185 yards of sheeting are how many pieces, each containing 45 yards?
2. A planter raised 49240 pounds of cotton on 94 acres. What was the average number of pounds to the acre?
3. A man bought 114 acres of land for 4104 dollars; what was the average price per acre?
4. Nine thousand dollars was paid to 75 operatives; what did each receive?
5. There are 24 hours in a day; how many days in 11424 hours?
6. In one hogshead are 63 gallons; how many hogsheads in 6615 gallons?
7. If a man travel 48 miles a day, how long will it take him to travel 1296 miles?
8. A garrison consumed 1712 barrels of flour in 107 days; how much was that per day?
9. How long would it take a vessel to sail from New York to China, allowing the distance to be 9072 miles, and the ship to sail 144 miles a day?
10. How long could 27 men subsist on a stock of provision that would last 1 man 3456 days?
11. A drover received 10362 dollars for 814 head of cattle; what was their average value per head?
12. If 42864 pounds of cotton be packed in 94 bales, what is the average weight of each bale?
13. If a field containing 42 acres produce 1659 bushels of wheat, what will be the number of bushels per acre?
14. In what time will a reservoir containing 109440 gallons, be emptied by a pump discharging 608 gallons per hour?
15. What number besides 216 will divide 75168 without a remainder?

LESSON LV.

1. At 8 cents a pound, how many pounds of sugar can be bought for \$16?

SUGGESTION: 1600 cents \div 8 cents = 1600 \div 8 = 200.

2. At 25 cents a bushel, how many potatoes will \$250 buy?

3. At 32 cents a pound for coffee, how much can be bought for \$288?

4. At \$2.25 a barrel for apples, how many apples can be purchased for \$40.50? \$405? \$4050?

5. At \$5.75 a barrel for flour, how much flour will \$97.75 buy? \$977.50? \$9775?

6. If 64 bushels of wheat cost \$80.00, what is the cost of one bushel?

7. If 10 barrels of apples cost \$22.75, what will 40 barrels cost?

8. If 100 acres of land cost \$2675, what is the cost per acre?

9. Divide \$5.60 by 8.

10. When 252 pounds of butter sell for \$84, what should 42 pounds sell for?

Find quotients and remainders. Prove the results.

1. 4636 \div 56.	11. 7948 \div 54.	21. 32465 \div 38.
2. 6824 \div 28.	12. 4826 \div 49.	22. 16849 \div 38.
3. 2583 \div 82.	13. 7244 \div 36.	23. 27548 \div 43.
4. 4428 \div 87.	14. 6549 \div 47.	24. 89641 \div 54.
5. 8229 \div 98.	15. 7819 \div 87.	25. 48564 \div 63.
6. 2348 \div 53.	16. 8125 \div 92.	26. 56403 \div 68.
7. 9748 \div 48.	17. 7687 \div 83.	27. 65047 \div 69.
8. 2714 \div 89.	18. 5462 \div 72.	28. 74326 \div 75.
9. 7228 \div 66.	19. 6553 \div 79.	29. 84408 \div 89.
10. 8849 \div 62.	20. 8814 \div 43.	30. 90885 \div 95.

LESSON LVI.

1. If \$6250 are paid for 25 horses, how many horses at the same average price can be bought for \$32000?
2. If 12 shares of city railway stock cost \$2616, how many shares will \$104640 buy?
3. An agent had \$6000 with which to buy flour. His expenses were \$112. He was allowed \$75 for his services. He bought 1000 barrels of flour and had \$818 left. What price per barrel was paid for the flour?
4. A man owns 328 acres of land, worth \$38704, and 298 shares of bank stock worth \$40528. What is the difference in value between an acre of land and a share of bank stock?
5. How many bushels of wheat, worth 88 cents a bushel, are worth as much as 3648 bushels of corn, at 83 cents a bushel?
6. Paid \$7500 for 125 acres of land. Cost per acre?
7. How long will it take a vessel to sail from New York to China, if the distance be 9028 miles, and the ship sail 148 miles a day?
8. A man paid \$170852 for 86 city lots. What was the average cost per lot?
9. $468455 \div 125$.
10. $346876 \div 128$.
11. $568942 \div 276$.
12. $654368 \div 326$.
13. $784854 \div 432$.
14. $584864 \div 356$.
15. $685207 \div 374$.
16. $657819 \div 297$.
17. $751682 \div 431$.
18. $728156 \div 458$.
19. $298764 \div 468$.
20. $568872 \div 517$.
36. $194978 \div 562$.
37. $486827 \div 641$.
38. $846845 \div 725$.
39. $428886 \div 841$.
40. $635842 \div 913$.
26. $198764 \div 648$.
27. $256851 \div 658$.
28. $341578 \div 781$.
29. $462486 \div 752$.
30. $521678 \div 845$.
31. $584217 \div 878$.
32. $694788 \div 958$.

LESSON LVII.

REDUCTION BY DIVISION.

1. How many pounds in 8460 ounces?
2. How many yards in 1242 inches?
3. How many gallons in 2847 pints?
4. How many pounds Troy in 28547 grains?
5. How many bushels in 1597 quarts?
6. How many pounds avoirdupois in 107520 ounces?
7. How many hours in 28635 seconds?
8. How many weeks in 8561829 seconds?
9. How many cords in 67898 cu. ft.?
10. How many cwt. in 1491 pounds?
11. Reduce 12244 pints to hogsheads.
12. Reduce 25600 sq. rds. to acres.
13. Reduce 51200 rds. to miles.
14. Reduce 6048 furlongs to miles.
15. Reduce 316800 in. to miles.
16. Reduce 1485 feet to fathoms.
17. Reduce 100000 sheets of paper to reams.
18. Reduce 27878400 sq. ft. to square miles.
19. Reduce 85894 grains to pounds Troy?
20. Reduce 51570 pounds to tons.
21. Change 4536 pounds of wheat to bushels.
22. Change 6912 pounds of oats to bushels.
23. Change 14000 pounds of corn to bushels.
24. Change 48760 cu. ft. to cords.
25. Change 70 times 800 acres to square miles.
26. Change 168474 ft. to miles.
27. Change 81556026 seconds to days.
28. What is $\frac{1}{4}$ of 10 bu., 8 pk., 2 qt. of wheat?
29. How many times are 4 bu., 8 pk., 2 qt., contained in 836 bu., 8 pk., 4 qt.?

LESSON LVIII.

PRINCIPLES.

Let the pupil be required to illustrate the following problems by original examples:

1. Given, several numbers, to find their sum.
2. Given, the sum of several numbers and all of them but one, to find that one.
3. Given, two numbers, to find their difference.
4. Given, the minuend and subtrahend, to find the remainder.
5. Given, the minuend and remainder, to find the subtrahend.
6. Given, the subtrahend and remainder, to find the minuend.
7. Given, two or more numbers, to find their product.
8. Given, the multiplicand and multiplier, to find the product.
9. Given, the product and multiplicand, to find the multiplier.
10. Given the product and multiplier, to find the multiplicand.
11. Given, two numbers, to find their quotients.
12. Given, the divisor and dividend, to find the quotient.
13. Given, the divisor and quotient, to find the dividend.
14. Given, the dividend and quotient, to find the divisor.
15. Given, the divisor, quotient and remainder, to find the dividend.
16. Given, the dividend, quotient and remainder, to find the divisor.

LESSON LIX.

1. How is $\frac{1}{2}$ of an apple obtained? $\frac{1}{2}$ of an apple is obtained by dividing the apple into 2 equal parts and taking one of the parts.

2. How is $\frac{1}{2}$ of a pile of sand obtained? $\frac{1}{2}$ of a pile of sand is obtained by dividing the pile into 2 equal parts and taking one of the parts.

3. How is $\frac{1}{2}$ of 10 oranges obtained? $\frac{1}{2}$ of 10 oranges is obtained by dividing the 10 oranges into 2 equal parts and taking one of the parts.

NOTE.—Let the pupil verify the above facts by his own measurement.

4. How is $\frac{1}{2}$ of a unit, quantity or number obtained? $\frac{1}{2}$ of a unit, quantity or number is obtained by dividing the unit, quantity or number into 2 equal parts and taking one of the parts.

5. What is meant by $\frac{1}{2}$ of a unit, quantity or number? By $\frac{1}{2}$ of a unit, quantity or number is meant one of the 2 equal parts into which the unit, quantity or number is divided.

6. How is $\frac{1}{3}$ of a melon obtained? $\frac{2}{3}$ of a melon?

7. What is meant by $\frac{1}{3}$ of a melon? $\frac{2}{3}$ of a melon?

8. What is meant by the expression $\frac{1}{3}?$ $\frac{2}{3}?$ $\frac{3}{3}?$

9. How is $\frac{1}{4}$ of 8 apples obtained? $\frac{2}{4}?$ $\frac{3}{4}?$

10. What is meant by $\frac{1}{4}$ of 8 apples? $\frac{2}{4}?$ $\frac{3}{4}?$ $\frac{4}{4}?$

11. What is meant by the expression $\frac{1}{4}?$ $\frac{2}{4}?$ $\frac{3}{4}?$

12. How is $\frac{1}{5}$ of 15 marbles obtained? $\frac{2}{5}?$ $\frac{3}{5}?$ $\frac{4}{5}?$

13. What is meant by $\frac{1}{5}$ of 15 marbles? $\frac{2}{5}?$ $\frac{3}{5}?$ $\frac{4}{5}?$

14. What is meant by the expression $\frac{1}{5}?$ $\frac{2}{5}?$ $\frac{3}{5}?$ $\frac{4}{5}?$

LESSON LX.

1. Show by means of a line how $\frac{1}{6}$ of 6 inches is obtained.

$\frac{2}{6}$. $\frac{3}{6}$. $\frac{4}{6}$. $\frac{5}{6}$.

2. What is meant by $\frac{1}{6}$ of a line? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$? etc.

3. What is meant by the expression $\frac{1}{6}$? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? etc.

4. How is $\frac{1}{7}$ of a pile of wood obtained? $\frac{2}{7}$? $\frac{3}{7}$? etc.

5. What is meant by $\frac{1}{7}$ of a pile of wood? $\frac{2}{7}$? $\frac{3}{7}$? etc.

6. What is meant by the expression $\frac{1}{7}$? $\frac{2}{7}$? $\frac{3}{7}$? etc.

7. How is $\frac{1}{8}$ of a pail of water obtained? $\frac{2}{8}$? $\frac{3}{8}$? etc.

8. What is meant by $\frac{1}{8}$ of a pail of water? $\frac{2}{8}$? $\frac{3}{8}$? etc.

9. What is meant by the expression $\frac{1}{8}$? $\frac{2}{8}$? $\frac{3}{8}$? $\frac{4}{8}$? etc.

10. How is $\frac{1}{9}$ of 27 pennies obtained? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? etc.

11. What is meant by $\frac{1}{9}$ of 27 pennies? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? etc.

12. What is meant by the expression $\frac{1}{9}$? $\frac{2}{9}$? $\frac{3}{9}$? $\frac{4}{9}$? etc.

13. How is $\frac{1}{10}$ of \$40 obtained? $\frac{2}{10}$? $\frac{3}{10}$? $\frac{4}{10}$? etc.

14. What is meant by $\frac{1}{10}$ of \$40? $\frac{2}{10}$? $\frac{3}{10}$? $\frac{4}{10}$? etc.

15. What is meant by the expression $\frac{1}{10}$? $\frac{2}{10}$? $\frac{3}{10}$? etc.

16. How is $\frac{1}{11}$ of 44 plums obtained? $\frac{2}{11}$? $\frac{3}{11}$? etc.

17. What is meant by $\frac{1}{11}$ of 44 plums? $\frac{2}{11}$? $\frac{3}{11}$? etc.

18. What is meant by the expression $\frac{1}{11}$? $\frac{2}{11}$? $\frac{3}{11}$? etc.

19. How is $\frac{1}{12}$ of 4 apples obtained? $\frac{2}{12}$? $\frac{3}{12}$? etc.

20. What is meant by $\frac{1}{12}$ of 4 apples? $\frac{2}{12}$? $\frac{3}{12}$? etc.

21. What is meant by the expression $\frac{1}{12}$? $\frac{2}{12}$? $\frac{3}{12}$? etc.

LESSON LXI.

1. 6 is $\frac{1}{3}$ of what number? $\frac{2}{3}$ of what number?

ANALYSIS: Since 6 is $\frac{2}{3}$ of a number, $\frac{1}{2}$ of the number is $\frac{1}{3}$ of 6, which is 3, and $\frac{2}{3}$, or the number is 3 times 3, which is 9.

2. 8 is $\frac{1}{5}$ of what number? $\frac{2}{5}$ of what number?

3. 9 is $\frac{1}{4}$ of what number? $\frac{2}{4}$ of what number?

4. 10 is $\frac{1}{7}$ of what number? $\frac{2}{7}$ of what number?

5. 12 is $\frac{1}{8}$ of what number? $\frac{2}{8}$ of what number?

6. 14 is $\frac{2}{9}$ of what number? $\frac{7}{9}$ of what number?

7. 15 is $\frac{2}{8}$ of what number? $\frac{5}{8}$ of what number?

8. 16 is $\frac{4}{9}$ of what number? $\frac{8}{9}$ of what number?

9. 18 is $\frac{3}{11}$ of what number? $\frac{6}{11}$ of what number?

10. 20 is $\frac{4}{5}$ of what number? $\frac{5}{5}$ of what number?

11. 24 is $\frac{4}{11}$ of what number? $\frac{6}{11}$ of what number?

12. 36 is $\frac{3}{7}$ of what number? $\frac{4}{7}$ of what number?

13. 42 is $\frac{6}{7}$ of what number? $\frac{7}{7}$ of what number?

14. 45 is $\frac{5}{8}$ of what number? $\frac{9}{8}$ of what number?

15. 54 is $\frac{6}{11}$ of what number? $\frac{9}{11}$ of what number?

16. 56 is $\frac{7}{8}$ of what number? $\frac{8}{8}$ of what number?

17. 63 is $\frac{7}{8}$ of what number? $\frac{9}{8}$ of what number?

18. 64 is $\frac{8}{12}$ of what number? $\frac{3}{3}$ of what number?

19. 72 is $\frac{6}{5}$ of what number? $\frac{8}{5}$ of what number?

20. 81 is $\frac{9}{7}$ of what number? $\frac{9}{5}$ of what number?

21. 84 is $\frac{7}{12}$ of what number? $\frac{12}{7}$ of what number?

22. 96 is $\frac{8}{9}$ of what number? $\frac{12}{5}$ of what number?

23. 108 is $\frac{9}{7}$ of what number? $\frac{12}{5}$ of what number?

24. 120 is $\frac{10}{9}$ of what number? $\frac{12}{9}$ of what number?

25. 132 is $\frac{11}{12}$ of what number? $\frac{12}{11}$ of what number?

26. 144 is $\frac{12}{9}$ of what number? $\frac{12}{12}$ of what number?

LESSON LXII.

1. If $\frac{2}{3}$ of a yard of tape cost 4 cents, what is the cost of 1 yard?

ANALYSIS: Since $\frac{1}{3}$ of a yard of tape costs 4 cents, $\frac{1}{2}$ of a yard costs $\frac{1}{2}$ of 4 cents, which is 2 cents, and $\frac{3}{2}$, or 1 yard, cost 3 times 2 cents, which is 6 cents.

2. If $\frac{2}{3}$ of a ton of coal cost \$6, what is the cost of 1 ton?

3. If $\frac{3}{4}$ of a box of oranges cost \$6, what is the cost of 1 box?

4. What is the cost of 1 box of soap, if $\frac{3}{4}$ of a box cost \$9?

5. What is the cost of a dining table, if $\frac{4}{5}$ of the cost is \$12?

6. What is the distance from A to B, if $\frac{4}{7}$ of the distance is 28 miles?

7. How far does he walk in 1 day who walks 15 miles in $\frac{5}{6}$ of a day?

8. How old is A, if $\frac{4}{9}$ of his age is 63 years?

9. How much does B owe C, if $\frac{6}{7}$ of the debt is \$96?

10. How many sheep are in a field, if $\frac{6}{7}$ of them equal 72 sheep?

11. In how many days can a bridge be built, if $\frac{7}{9}$ of it can be built in 63 days?

12. How many yards are in a bolt of cloth, if $\frac{7}{12}$ of the bolt contains 49 yards?

13. In how many days can a man build a wall, if he can build $\frac{8}{9}$ of it in 56 days?

14. A farmer sold 72 acres of land, which is $\frac{8}{12}$ of his farm. How many acres were in the farm?

15. A boy spent 63 cents, which is $\frac{9}{11}$ of all he had. How much had he?

16. How much money has A, if $\frac{9}{5}$ of his money is \$81?

17. If $\frac{3}{4}$ of a cord of wood costs \$6, what is the cost of $\frac{5}{6}$ of a cord?

LESSON LXIII.

1. Draw a line six inches long and divide it into two equal parts. Tell why each part is called $\frac{1}{2}$ of the line.

1 line equals how many half-lines? 2 lines? 5 lines? 8 lines? 10 lines? 12 lines?

1 equals how many halves? 2? 4? 6? 7? 9? 11? 12?

Divide the same line into three equal parts and tell why each part is called $\frac{1}{3}$ of the line.

1 line equals how many third-lines? 3 lines? 5 lines? 7 lines? 9 lines? 11 lines?

1 equals how many thirds? 2? 4? 6? 8? 10? 12?

Examine the line and tell which is the greater part, $\frac{1}{2}$ or $\frac{1}{3}$, $\frac{1}{2}$ or $\frac{2}{3}$?

Divide the same line into four equal parts and tell why each part is called $\frac{1}{4}$ of the line.

1 line equals how many fourth-lines? $\frac{1}{2}$ line? 2 lines? 4 lines? 6 lines? 8 lines? 10 lines? 12 lines?

1 equals how many fourths? $\frac{1}{2}$? 3? 6? 7? 9? 11? 12?

Examine the line and tell which is the greater part, $\frac{1}{2}$ or $\frac{1}{4}$, $\frac{1}{3}$ or $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{2}{3}$, $\frac{2}{3}$ or $\frac{3}{4}$? What two parts are equal?

Divide the same line into six equal parts, and tell why each part is called $\frac{1}{6}$ of the line.

1 line equals how many sixth-lines? $\frac{1}{2}$ line? $\frac{1}{3}$ line? $\frac{1}{4}$ line? 3 lines? 5 lines? 7 lines? 9 lines?

1 equals how many sixths (6ths)? $\frac{1}{2}$? $\frac{1}{3}$? $\frac{2}{3}$? 2? 4? 6? 8? 10? 12?

Draw a line 8 inches long, divide it into eight equal parts and tell why each part is called $\frac{1}{8}$ of a line. Divide the same line into halves and fourths.

1 line equals how many eighth-lines? $\frac{1}{2}$ line? $\frac{1}{4}$ line? $\frac{3}{4}$ lines? 3 lines? 5 lines? 7 lines? 9 lines? 11 lines?

LESSON LXIV.

Draw a line 9 inches long; divide it into nine equal parts, and tell why each part is called $\frac{1}{9}$ of the line. Divide the same line into thirds.

1 line equals how many ninth-lines? $\frac{1}{3}$ line? $\frac{2}{3}$ lines?
 2 lines? 4 lines? 6 lines? 8 lines? 10 lines? 12 lines?
 1 equals how many ninths? $\frac{1}{3}$? $\frac{2}{3}$? 3? 5? 7? 9?
 11?

Draw a line 10 inches long; divide it into ten equal parts and tell why each part is called $\frac{1}{10}$ of the line? Divide the same line into halves and fifths.

1 line equals how many tenth-lines? $\frac{1}{2}$ line? $\frac{1}{5}$ line?
 $\frac{2}{5}$ lines? $\frac{3}{5}$ lines? $\frac{4}{5}$ lines? 3 lines? 5 lines? 7 lines?
 9 lines? 11 lines?

1 equals how many tenths? $\frac{1}{2}$? $\frac{1}{5}$? $\frac{2}{5}$? $\frac{3}{5}$? $\frac{4}{5}$? 2? 4?
 6? 8? 10? 12?

Draw a line 12 inches long; divide it into twelve equal parts, and tell why each of these parts is called $\frac{1}{12}$ of the line? Divide the same line into halves, thirds, fourths, and sixths.

1 line equals how many twelfth-lines? $\frac{1}{2}$ line? $\frac{1}{3}$ line?
 $\frac{2}{3}$ lines? $\frac{1}{4}$ line? $\frac{2}{4}$ lines? $\frac{3}{4}$ lines? $\frac{1}{6}$ line? $\frac{2}{6}$ lines?
 $\frac{3}{6}$ lines? $\frac{4}{6}$ lines? $\frac{5}{6}$ lines? 2 lines? 4 lines? 6 lines?
 8 lines? 10 lines? 12 lines?

1 equals how many twelfths? $\frac{1}{2}$? $\frac{1}{3}$? $\frac{2}{3}$? $\frac{1}{4}$? $\frac{2}{4}$? $\frac{3}{4}$?
 $\frac{1}{6}$? $\frac{2}{6}$? $\frac{3}{6}$? $\frac{4}{6}$? $\frac{5}{6}$? 3? 5? 7? 9? 11?

LESSON LXV.

1. How many halves are in 2 ? $2\frac{1}{2}$? 3 ? $4\frac{1}{2}$? 5 ? $6\frac{1}{2}$?
2. How many halves are in 7 ? $8\frac{1}{2}$? 9 ? 10 ? 11 ? $12\frac{1}{2}$?
3. How many thirds are in $2\frac{1}{3}$? 3 ? $4\frac{2}{3}$? $5\frac{1}{3}$? $6\frac{2}{3}$? $8\frac{1}{3}$?
4. How many fourths are in $8\frac{1}{4}$? $4\frac{3}{4}$? $6\frac{1}{4}$? $8\frac{3}{4}$? $9\frac{1}{4}$? $12\frac{3}{4}$?
5. How many fifths are in $8\frac{1}{5}$? $4\frac{2}{5}$? $6\frac{3}{5}$? $7\frac{4}{5}$? $9\frac{2}{5}$? $12\frac{4}{5}$?
6. How many sixths are in $4\frac{1}{6}$? $5\frac{1}{6}$? $7\frac{2}{6}$? $8\frac{3}{6}$? $9\frac{4}{6}$? $11\frac{5}{6}$?
7. How many sevenths are in $8\frac{1}{7}$? $4\frac{3}{7}$? $5\frac{1}{7}$? $6\frac{2}{7}$? $7\frac{4}{7}$? $9\frac{1}{7}$?
8. How many eighths are in $5\frac{1}{8}$? $6\frac{2}{8}$? $7\frac{3}{8}$? $8\frac{4}{8}$? $9\frac{5}{8}$? $12\frac{7}{8}$?
9. How many ninths are in $6\frac{1}{9}$? $7\frac{1}{9}$? $8\frac{2}{9}$? $9\frac{3}{9}$? $11\frac{5}{9}$? $12\frac{1}{9}$?
10. How many tenths are in $5\frac{1}{10}$? $6\frac{3}{10}$? $7\frac{4}{10}$? $6\frac{7}{10}$?
11. How many elevenths are in $4\frac{2}{11}$? $5\frac{3}{11}$? $6\frac{4}{11}$? $7\frac{5}{11}$? $8\frac{6}{11}$? $9\frac{7}{11}$?
12. How many twelfths are in $5\frac{1}{12}$? $6\frac{2}{12}$? $7\frac{5}{12}$? $8\frac{7}{12}$? $9\frac{10}{12}$? $12\frac{11}{12}$?
13. How many are 2 times $\frac{1}{3}$? 8 times $\frac{1}{4}$? 4 times $\frac{1}{5}$?
14. How many are 5 times $\frac{1}{6}$? 6 times $\frac{1}{7}$? 7 times $\frac{1}{8}$?
15. How many are 8 times $\frac{1}{9}$? 9 times $\frac{1}{10}$? 11 times $\frac{1}{12}$?
16. How many are $\frac{1}{2}$ of $\frac{2}{3}$? $\frac{1}{3}$ of $\frac{3}{4}$? $\frac{1}{4}$ of $\frac{4}{5}$?
17. How many are $\frac{1}{5}$ of $\frac{5}{6}$? $\frac{1}{6}$ of $\frac{6}{7}$? $\frac{1}{7}$ of $\frac{7}{8}$?
18. How many are $\frac{1}{8}$ of $\frac{8}{9}$? $\frac{1}{9}$ of $\frac{9}{10}$? $\frac{1}{10}$ of $\frac{10}{11}$?
19. How many are $\frac{1}{2}$ of $1\frac{1}{3}$? $\frac{1}{3}$ of $1\frac{1}{5}$? $\frac{1}{4}$ of $1\frac{1}{7}$?
20. How many are $\frac{1}{5}$ of $1\frac{1}{3}$? $\frac{1}{6}$ of $1\frac{1}{11}$? $\frac{1}{7}$ of $4\frac{2}{3}$?
21. How many are $\frac{1}{8}$ of $4\frac{1}{3}$? $\frac{1}{9}$ of $7\frac{1}{5}$? $\frac{1}{10}$ of $5\frac{1}{7}$?
22. How many ones equal $\frac{2}{3}$? $\frac{1}{2}$? $\frac{3}{4}$? $\frac{2}{5}$? $\frac{1}{4}$? $\frac{15}{8}$?
23. How many ones equal $\frac{5}{6}$? $\frac{12}{3}$? $\frac{18}{5}$? $\frac{21}{7}$? $\frac{36}{9}$?
24. How many ones equal $\frac{12}{4}$? $\frac{28}{7}$? $\frac{35}{5}$? $\frac{60}{6}$? $\frac{42}{8}$? $\frac{54}{9}$?
25. How many ones equal $\frac{35}{7}$? $\frac{84}{8}$? $\frac{56}{6}$? $\frac{72}{9}$? $\frac{81}{9}$? $\frac{108}{12}$?
26. How many ones equal $\frac{60}{6}$? $\frac{120}{10}$? $\frac{88}{8}$? $\frac{132}{12}$? $\frac{99}{9}$? $\frac{144}{16}$?

LESSON LXVI.

1. A boy spent $\$ \frac{3}{5}$ for a book and $\$ \frac{1}{5}$ for a slate. How much did he spend for both?
2. James rode $\frac{4}{7}$ of a mile and walked $\frac{2}{7}$ of a mile. How far did he travel?
3. John's father gave him $\$ \frac{3}{8}$ and his mother $\$ \frac{2}{8}$. How much was given him?
4. Sold $\frac{5}{9}$ of an acre to one man and $\frac{8}{9}$ to another. How much was sold to both?
5. A ran $\frac{5}{11}$ of a mile and B ran $\frac{6}{11}$ of a mile. How far did they both run?
6. If B pays $\frac{5}{8}$ of the cost of a carriage and C pays the remainder, how much does C pay?
7. D rode 1 mile, walked $\frac{2}{3}$ of a mile and ran $\frac{1}{3}$ of a mile. How far did he travel?
8. John earned $\$ \frac{1}{5}$ Monday, $\$ \frac{2}{5}$ Tuesday and $\$ \frac{2}{5}$ Wednesday. How much did he earn?
9. James lost $\$ \frac{4}{5}$ Monday, $\$ \frac{3}{5}$ Tuesday and $\$ \frac{3}{5}$ Wednesday. How much did he lose?
10. A bought at one time $1\frac{1}{4}$ yards of cloth, at another $\frac{3}{4}$ yards. How many yards did he buy?
11. Paid $\$1\frac{1}{2}$ for a book and $\$1\frac{1}{2}$ for a paper. How much more was paid for the book than for the paper?
12. A traveled $\frac{7}{12}$ of a mile, and B in the opposite direction $\frac{5}{12}$ of a mile. How far apart are they then?
13. $\frac{7}{12}$ of a merchant's goods were damaged by water. What part were saved?
14. A bought $\frac{7}{16}$ of a farm, B $\frac{5}{16}$, and C the remainder. What part of the farm did C buy?
15. $\frac{7}{18}$ of an estate was given to a son, $\frac{5}{18}$ to a daughter, and the remainder to the wife. What part of the estate did the wife get?

LESSON LXVII.

1. What is the cost of 3 yards of cloth, if 1 yard costs $\$ \frac{3}{4}$?
2. If 1 basket of peaches cost $\$ \frac{3}{4}$, what is the cost of 4 baskets?
3. What is the cost of 5 pounds of tea, if 1 pound cost $\$ \frac{4}{5}$?
4. If 1 boy earns $\$ \frac{4}{6}$, at the same rate how much do 6 boys earn?
5. What is the distance 7 times round an island, if the distance once around it is $\frac{4}{7}$ miles?
6. If 1 pen knife is worth $\$ \frac{1}{4}$, what is the value of 8 such knives?
7. How far do 8 men carry a load, if each man carries it $\frac{9}{12}$ miles?
8. If 1 bushel of corn is worth $\$ \frac{8}{12}$, what are 9 bushels worth?
9. How far does a boy walk in 11 hours, if he walks $\frac{8}{11}$ of a mile each hour?
10. If 1 man can dig $\frac{6}{9}$ of a rod of ditch in one day how much can 12 men dig in the same time?
11. What is the cost of 5 books, if 2 books cost $\$ \frac{4}{5}$?
12. If 3 men can earn $\$ \frac{6}{8}$ an hour, how much can 4 men earn in the same time?
13. What is the cost of 9 pine apples, if 4 pine apples cost $\$ \frac{8}{9}$?
14. If 3 cwt. of hay cost $\$ \frac{9}{10}$, what is the cost of 10 cwt.?
15. What is the cost of 7 melons, if 3 melons cost $\$ \frac{6}{7}$?
16. If 2 brushes cost $\$ \frac{8}{11}$, what is the cost of 11 brushes?
17. What is the cost of 6 plates, if 5 plates cost $\$ \frac{10}{12}$?
18. If 7 boxes cost $\$ \frac{28}{12}$, what is the cost of 9 boxes?

LESSON LXVIII.

CANCELLATION.

1. How many cords of wood can be piled into a shed that is 48 ft. long, 24 ft. wide, and 16 ft. high?

SUGGESTION: The capacity of the shed is a number of cubic feet equal to the product of $48 \times 24 \times 16$.

The contents of a cord of wood is a number of cubic feet equal to the product of $8 \times 4 \times 4$.

The capacity of the shed is the dividend.

The contents of a cord of wood is the divisor.

Instead of combining these sets of factors into products, the division may be performed by dividing the factors of the dividend by the factors of the divisor, thus :

$$\begin{array}{r} 6 \times 6 \times 4 = 144 \text{ Cords, Ans.} \\ 48 \times 24 \times 16 \\ \hline 8 \times 4 \times 4 \end{array}$$

This method of division is called *Cancellation*, since it consists in striking out equal factors from dividend and divisor.

In actual practice the "striking out" process is indicated thus:

$$\begin{array}{r} 6 \quad 6 \quad 4 \\ \cancel{48} \times \cancel{24} \times \cancel{16} \\ \hline 8 \times 4 \times 4 \end{array} = 144$$

Division by cancellation should be practiced whenever the dividend and divisor, either or both, consist of factors common to both.

2. The factors of a dividend are 16, 21, 38 and 45; of the divisor 5, 7, 11 and 15; what is the quotient?

3. How many barrels of flour at \$9 a barrel must be given for 27 yards of cloth at \$4 a yard?

4. How many bushels of apples at 75 cents a bushel will pay for 85 pounds of coffee at 30 cents a pound?

5. A farmer exchanged 45 bushels of potatoes worth 40 cents a bushel for 18 pounds of tea. What was the tea worth a pound?

LESSON LXIX.

1. How many tons of hay at \$9 a ton, must be given for 27 cords of wood, at \$4 a cord?
2. How many bushels of corn, worth 60 cents a bushel, must be given for 25 bushels of rye, worth 90 cents a bushel?
3. How many peaches, worth 2 cents each, must be given for 48 oranges, at 3 cents each?
4. How many days' work, at 75 cents a day, will pay for 30 pounds of coffee, at 15 cents a pound?
5. How many suits of clothes, at \$24 a suit, can be made from 5 pieces of cloth, each containing 48 yards, at \$8 a yard?
6. How many tubs of butter, each containing 48 pounds, at 14 cents a pound, must be given for 8 boxes of tea, each containing 42 pounds, worth 60 cents a pound?
7. A laborer gave 12 days' work for 48 bushels of potatoes, worth 50 cents a bushel. What were his daily earnings?
8. A grocer sold 24 boxes of soap, each containing 55 pounds, at 10 cents a pound, and received as pay 88 barrels of apples, each containing 8 bushels. How much were the apples worth a bushel?
9. Sold 20 pounds of butter at 57 cents a pound, which exactly paid for 15 pounds of coffee. What was the price of the coffee a pound?
10. A merchant bought 6 loads of oats, each load containing 22 bags, and each bag 2 bushels, worth 56 cents a bushel. He gave in payment 8 boxes of tea, each containing 24 pounds. What was the tea worth a pound?
11. How many bushels of oats at \$.60 a bushel, will pay for 12 tons of coal at \$7.20 a ton?
12. How many firkins of butter, each containing 56 pounds, at 18 cents a pound, must be given for 4 barrels of sugar, each containing 182 pounds, at 6 cents a pound?

LESSON LXX.

1. How many days' work, at 84 cents a day, will pay for 36 bushels of corn, worth 56 cents a bushel?
2. A farmer exchanged 60 bushels of oats, worth 45 cents a bushel, for 25 pounds of tea; what was the tea worth a pound?
3. A grocer bought 12 pounds of cheese, at 9 cents a pound, and paid in molasses, at 45 cents a gallon; how many gallons of molasses paid for the cheese?
4. Gave 12 barrels of flour, at \$7 a barrel, for hay worth \$18 a ton; how many tons of hay was the flour worth?
5. Sold 8 firkins of butter, each weighing 56 pounds, at 15 cents a pound, and received in payment 3 boxes of tea, each containing 40 pounds; what was the tea worth a pound?
6. A man took 6 loads of apples to market, each load containing 14 barrels, and each barrel 3 bushels. He sold them at 50 cents a bushel, and received in payment 9 barrels of sugar, each weighing 210 pounds; what was the sugar worth a pound?
7. A grocer sold 12 boxes of soap, each containing 51 pounds, at 10 cents a pound; he received in payment a certain number of barrels of potatoes, each containing 8 bushels, at 30 cents a bushel; how many barrels did he receive?
8. A man sold 4 loads of barley, each load containing 60 bushels, at 70 cents a bushel, and received in payment 2 pieces of cloth, each piece containing 35 yards; what was the cloth worth a yard?
9. How many bales of cloth, each containing 40 pieces, and each piece containing 36 yards, worth \$8 a yard, must be given for 120 government bonds, worth \$108 each?
10. How many barrels of potatoes, each containing 3 bushels, worth 40 cents a bushel, will pay for 12 boxes of soap, each containing 51 pounds, worth 10 cents a pound?

LESSON LXXI.

INTEREST.

1. When the interest of \$100 for one year is \$6, what is the interest of \$200 for the same time? \$800? \$400? \$700? \$1000?
2. At the rate of \$6 for the use of \$100, what is the interest of \$50? \$25? \$20? \$10?
3. *Interest* is money paid for the use of money.
4. A man *borrow*s \$100 for one year, and agrees to pay 6 per cent. interest. How much does he owe at the end of the year? He owes the \$100 which he borrowed, and \$6 for the use of the same.
5. The \$100 is called *principal*. The \$6 is called *interest*. The *principal* and *interest* united (\$106), is called *amount*.
6. *Principal* is money for the use of which interest is paid.
7. In computing interest the unit of time is *one year*.
8. Six per cent. interest means \$6 for the use of \$100 one year. Five per cent. interest means \$5 for the use of \$100 one year. Ten per cent. interest means \$10 for the use of \$100 one year.
9. What is meant by four per cent. interest? Seven per cent.? Eight per cent.?
10. The terms used in this lesson are *Principal*, *Interest*, *Rate per cent.*, and *Time*.
11. At 6 per cent., what is the interest of \$1 for one year? \$2? \$3? \$5? \$7? \$11?
12. At 5 per cent., what is the interest of \$1 for one year? \$2? \$3? \$6? \$8? \$12?
13. At 7 per cent., what is the interest of \$1 for one year? \$2? \$3? \$5? \$8? \$9?
14. At 8 per cent., what is the interest of \$1 for one year? \$10? \$20? \$30? \$40? \$50?

LESSON LXXII.

1. At 6 per cent., what is the interest of \$375 for one year?

SUGGESTION: $\$375 - \$300 + \$50 + \$25.$

Interest of \$300 = \$18.

Interest of \$50 = \$3.

Interest of \$25 = \$1.50.

Interest of \$375 = \$22.50.

2. At 8 per cent., what is the interest of \$425 for one year?

3. At 7 per cent., what is the interest of \$775 for one year?

4. At 5 per cent., find one year's interest of \$285.

5. At 4 per cent., find the annual interest of \$475.

6. At 6 per cent., what is one year's interest of \$100?
2 years? 8 years? 4 years? 5 years? 6 years?

7. At 4 per cent., what is two years' interest of \$100?
4 years? 6 years? 8 years? 10 years?

8. What is the interest of \$300 for 3 years at 8 per cent?

9. Find the interest of \$400 for 2 years at 7 per cent.

10. A man borrows \$500 for 3 years, and agrees to pay 5 per cent. interest. What was due at the end of the 3 years?

SUGGESTION: Find the interest. Then find the amount.

12. How much is due on a debt of \$600 on interest for 2 years at 6 per cent?

13. A was \$800 in debt to B for 3 years at 5 per cent. interest. How much was due B at the end of the time?

14. C loaned D \$900 for 4 years at 8 per cent. How much should D receive at the expiration of the time?

15. How much should one man pay to another for a loan of \$1000 for 5 years at 10 per cent?

LESSON LXIII.

1. When \$6 is the interest for 1 year, what is the interest for 6 months? 4 months? 2 months? 8 months? 10 months?

2. At 6 per cent., find the interest of

\$125 for 1 year 6 months.

\$146 for 2 years 8 months.

\$175 for 3 years 10 months.

\$225 for 1 year 2 months.

\$290 for 2 years 4 months.

3. The interest of \$1 for 12 months, at 6 per cent., is \$.06. What is the interest for 1 month? 3 months? 5 months? 7 months? 9 months? 11 months?

4. The interest of \$1 for 1 month, or 30 days, at 6 per cent., is 5 mills (\$.005). What is the interest for 6 days? 12 days? 18 days? 24 days?

5. Find the interest of \$150 for 8 years, 10 months; 24 days, at 6 per cent.

OPERATION: Interest of \$1. 6 years—\$.18.

Interest of \$1. 10 mos. —\$.05.

Interest of \$1. 24 days —\$.004.

\$.234.

$$.234 \times 150 = \35.10 Int. *Ans.*

Find 6 per cent. interest of

6. \$50 for 1 year, 2 months, 6 days.

7. \$65 for 1 year, 3 months, 12 days.

8. \$75 for 2 years, 4 months, 18 days.

9. \$182 for 1 year, 7 months, 24 days.

10. \$175 for 3 years, 6 months, 12 days.

11. \$250 for 2 years, 6 months, 24 days.

12. \$325 for 2 years, 5 months, 6 days.

13. \$412 for 2 years, 9 months, 18 days.

14. \$450 for 3 years, 8 months, 24 days.

15. \$1,000 for 6 years, 6 months, 6 days.

APPENDIX.

[Prepared at the suggestion of Mr. ADOLF KRAUS, Ex-President Chicago Board of Education.]

Rapidity in obtaining results in number work should be secured to the pupil at every suitable stage of his progress and development. Lesson XLVII., Chapter Two, page 120, contains examples involving the two operations of *Addition* and *Subtraction*. In such questions, time and mechanical labor are saved by combining the two processes into one, that of *Addition*, as shown by the solution in the Lesson referred to.

By a like process of *Addition* the successive remainders in Long Division may be readily obtained.

OPERATION.

1. $26588 \div 46 = 578.$

358

368

368

Let the arrangement of terms be that of an equation.

The operation may be recited thus:

$265 + 46 = 5$. Five 6's are 30. 30 and 5 are 35. Write 5 remainder. Five 4's are 20. $20 + 3$ and 3 = 26. Write 3 remainder.

$358 + 46 = 7$. Seven 6's = 42. 42 and 6 = 48. Write 6 remainder. Seven 4's = 28. $28 + 4$ and 3 = 35. Write 3 remainder.

$368 + 46 = 8$. Eight 6's = 48. No remainder. Eight 4's = 32. $32 + 4 = 36$. No remainder.

2. $2081784 \div 4846 = 479.$

34388

39114.

Let the pupil "think out loud,"

thus:

{ 4346 in 20817 4 times.

4 times 6 are 24 and 3 are 27. (Writes 3 remainder.)

4 times 4 are 16, with 2 to carry; 18 and 3 are 21. (Writes 3 remainder.)

4 times 3 are 12, with 2 to carry; 14 and 4 are 18. (Writes 4 remainder.)

4 times 4 are 16, with one to carry; 17 and 3 are 20. (Writes 3 remainder.)

To the remainder 3433 bring down 3 for the second partial dividend.

4346 in 34333, 7 times.

{ 7 times 6 are 42 and 1 are 43. (Writes 1 remainder.)
 { 7 times 4 are 28, with 4 to carry, 32, and 1 are 33. (Writes 1 remainder.)
 { 7 times 3 are 21, with 3 to add, 24 and 9 are 33. (Writes 9 remainder.)
 { 7 times 4 are 28, with 3 to add; 31 and 3 are 34. (Writes 3 remainder.)
 { To the remainder 3911 bring down 4 for the third partial dividend.
 4346 in 39114, 9 times.

{ 9 times 6 are 54. (No remainder.)
 { 9 times 4 are 36, with 5 to add, are 41. (No remainder.)
 { 9 times 3 are 27, with 4 to add, are 31. (No remainder.)
 { 9 times 4 are 36, with 3 to add, are 39. (No remainder.)

Let the pupil recite the operations performed in the following divisions:

$$3. \quad 428728 \div 746 = 568. \quad 5. \quad 500000 \div 675 = 740.$$

$$\begin{array}{r}
 5072 \\
 \hline
 5968
 \end{array}
 \quad
 \begin{array}{r}
 2750 \\
 \hline
 500
 \end{array}$$

$$4. \quad 425852 \div 469 = 908. \quad 6. \quad 288888776 \div 46297 = 6248$$

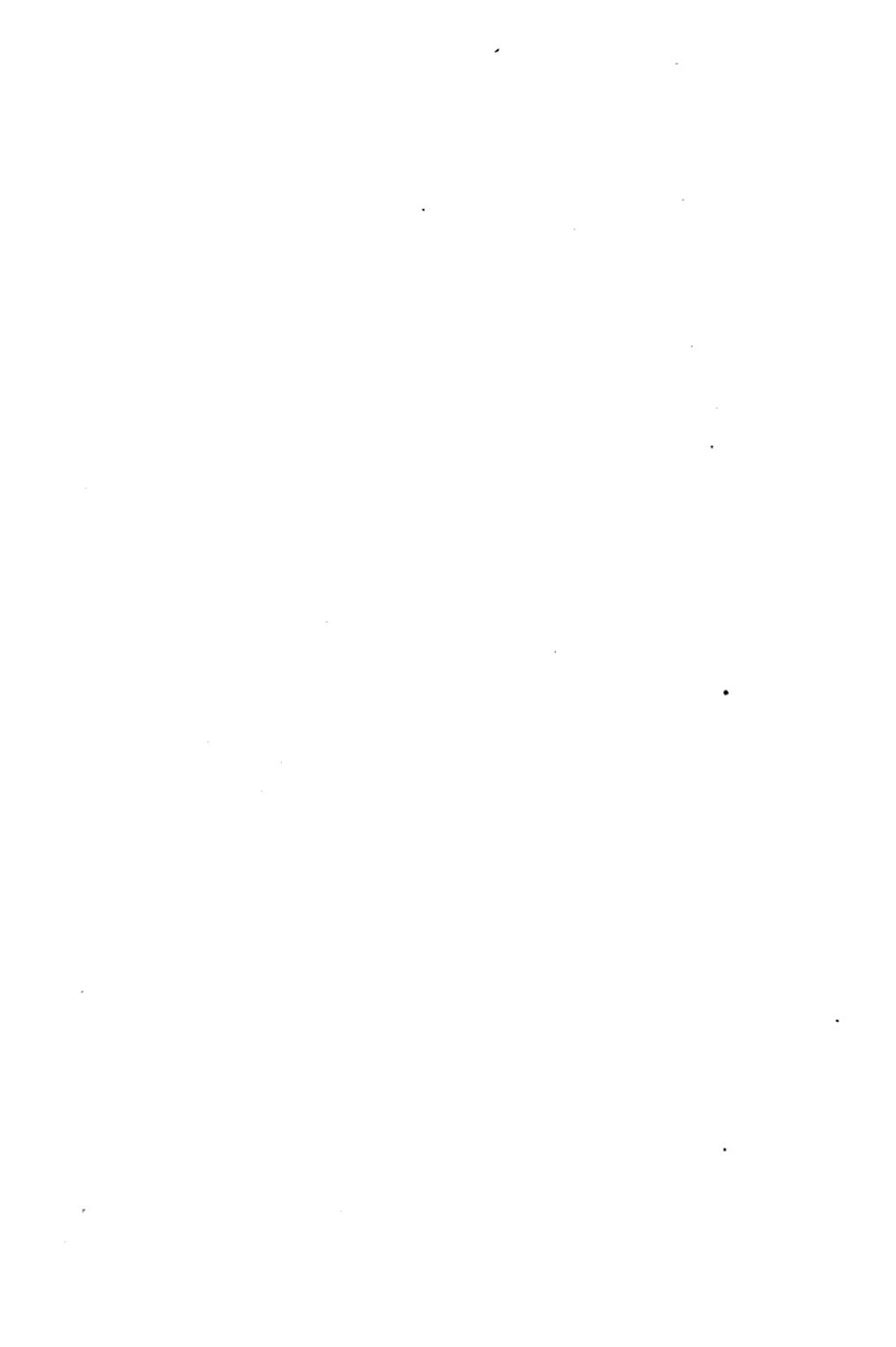
$$\begin{array}{r}
 8752 \\
 \hline
 114667
 \end{array}
 \quad
 \begin{array}{r}
 221987 \\
 \hline
 869896
 \end{array}$$

The pupil should now be able to find the *remainder* for himself.

$$7. \quad 15946 \div 87 = 458. \quad 9. \quad 108375 \div 125 = 827.$$

$$8. \quad 47085 \div 78 = 645. \quad 10. \quad 824864 \div 428 = 768.$$

Pupils may now be required to perform the examples on pp. 208 and 204 by the process here presented.





154,687.50

154,687.50





